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ABSTRACT

Developed with input from personnel in the industries, this reference book complements a matching curriculum guide for a course on the textiles and apparel industries. The book emphasizes job skills and the attitudes and interpersonal skills needed for successful employment in the textiles/apparel industry. Each of the 22 chapters of the book begins with one or more essential elements and objectives. Within the text, highlighted vocabulary terms are defined or explained. Chapter summaries, vocabulary sections, and review questions are provided for each chapter. A 34-item reference list and an index of technical terms appear at the end of the book. The chapters cover these topics: the textiles and apparel industries; job success in these industries; maintaining customer relations; safety and sanitation; goals, policies, and procedures; textiles and apparel--terminology, use, and care; selection of fabrics and notions for garment design; elements and principles of design; sewing, repairing, and pressing techniques; measuring for custom-made garments; pattern alteration procedures; unit construction techniques; garment alterations--fitting; garment alterations--adjustments; quality in apparel and accessories; coordinating apparel and accessories; marketing--promotions and special events; visual merchandising; use and care of sewing and pressing equipment; receiving, marking, and identifying laundry and dry cleaning; laundry and dry cleaning procedures; and safety and sanitation for laundering, pressing, and dry cleaning. (KC)

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Apparel and Textiles Production, Management, and Services

Reference Book

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PREFACE

The textiles and apparel industries are growing and diverse industries. Textiles are used to make apparel and a wide variety of other items from burn bandages and artificial arteries to parts for space vehicles and airplane bodies. Clothing is the most obvious product of the textiles and apparel industries. The fashion industries employ people in a variety of roles including fashion design, apparel manufacturing, and retailing. In addition, employment areas such as advertising, fashion journalism, visual merchandising, and marketing are areas in which individuals may specialize. The area of clothing services employs individuals in custom sewing, tailoring, dressmaking, dry cleaning, laundering, alterations, personal shopping, and many other occupations. Professional home economists are employed in a wide range of occupations including teaching and consulting.

More than two million people are employed by the textiles and apparel industries. More than five thousand textiles companies and approximately twenty thousand apparel firms exist in the United States. In 1987, forty-eight states had textile plants, fifty states had apparel manufacturing plants, and forty-eight states produced natural or manufactured fiber. There are heavy concentrations of these industries in all parts of the United States. Jobs exist that require different levels of training and education. Entry-level jobs offer inexperienced employees opportunities to receive training and to be promoted to higher level positions when experience and skill are gained. Other jobs are available to individuals with education in areas related to apparel and textiles.

This reference book presents general information about various areas of the textiles and apparel industries. The content of the book should be read with an understanding that some employment situations will fit the descriptions provided while others will vary. Therefore, hands-on experience and use of other resource materials are important components of the total training experiences needed by students accepting employment in the textiles and apparel industries.

Reference Book

The *Reference Book* provides information needed by employees in the occupational area. Each chapter begins with one or more Essential Elements and Objectives to Achieve. Within the text, italicized, boldfaced vocabulary terms are included with definitions or explanations. Illustrations are also included to aid student learning. The content of each chapter is summarized in Points to Remember, and vocabulary terms are repeated in a list of Words to Know. Technical terms and concepts may be located quickly by using the index included in the book. Questions for Review are provided for the student as a self-test.

The *Apparel and Textiles Production, Management, and Services* reference book is concentrated on the skills and attitudes needed for successful employment in the textiles and apparel industries. The book is organized into twenty-two chapters that are intended to be used as needed, not in any particular order. No one reference can provide all the information needed for a career in a particular field. Therefore, students should be encouraged to study various topics more intensively, to use additional references, and to apply the information in either laboratory or on-the-job training. Hands-on experience is essential to understanding the concepts presented in this reference book.

Apparel and Textiles Production, Management, and Services is part of an occupational education series that focuses on a broad range of employment opportunities. Each title in the series addresses one career cluster. The materials may be used for one or more years of instruction. Curriculum materials for other career clusters are also available from the Home Economics Curriculum Center, Texas Tech University, P.O. Box 4067, Lubbock, Texas 79409-1161.

TAC 75.83
APPAREL AND TEXTILES PRODUCTION, MANAGEMENT, AND SERVICES

(q) Apparel and textiles production, management, and services (two units) shall include the essential elements in this subsection. All courses shall include the essential elements in paragraphs (1) and (2) of this subsection. In addition, training programs emphasizing apparel and textiles production shall include the essential elements in paragraphs (3) – (5) of this subsection, training programs emphasizing apparel and textiles management and services shall include the essential elements in paragraphs (6) – (8) of this subsection, and training programs emphasizing apparel and textiles services shall include the essential elements in paragraphs (9) and (10) of this subsection.

(1) Concepts and skills related to managing apparel business and responsibilities. The student shall be provided opportunities to:

(A) demonstrate how to function effectively in routine operations;
(B) demonstrate interpersonal qualities which lead to job success in apparel and textiles industry;
(C) describe techniques for maintaining good customer relationships;
(D) demonstrate safety practices and sanitation procedures; and
(E) apply organizational goals, policies, and procedures.

(2) Concepts and skills related to identifying and describing apparel. The student shall be provided opportunities to:

(A) apply correct textiles and apparel terminology;
(B) identify textile characteristics and care; and
(C) relate textile characteristics to garment design, construction, alteration, and repair.

(3) Concepts and skills related to the production of clothing and accessories. The student shall be provided opportunities to:

(A) select fabrics and notions suitable for garment design;
(B) apply design elements when designing, constructing, or altering apparel;
(C) apply appropriate sewing and pressing techniques in garment construction; and
(D) apply safety procedures while operating equipment.

(4) Concepts and skills related to constructing custom-made garments. The student shall be provided opportunities to:

(A) apply appropriate procedures when measuring for custom garment;
(B) apply pattern alteration procedures to ensure custom fit of garment; and
(C) apply unit construction techniques.

(5) Concepts and skills related to garment alteration and repair. The student shall be provided opportunities to:

(A) describe considerations for fitting garments;
(B) demonstrate garment adjustments following alteration markings; and
(C) demonstrate appropriate garment repair techniques.

(6) Concepts and skills related to clothing and accessories. The student shall be provided opportunities to:

(A) apply design elements when designing, constructing, or altering apparel;
(B) identify signs of quality in clothing and accessories; and
(C) illustrate coordination of clothing and accessories for infants, children, or adults.

(7) Concepts and skills related to advertising and promotional activities. The student shall be provided opportunities to:

- (A) apply marketing techniques when assisting with promotions and special events; and
- (B) prepare fashion displays.

(8) Concepts and skills related to selection, storage, use, and care of sewing tools and equipment. The student shall be provided opportunities to:

- (A) demonstrate safety practices while using and storing equipment;
- (B) demonstrate appropriate use and care of sewing or pressing equipment; and
- (C) demonstrate sewing, repairing, or pressing techniques.

(9) Concepts and skills related to garment alterations and repairs. The student shall be provided opportunities to:

- (A) describe considerations for fitting garments;
- (B) demonstrate garment adjustments following alteration markings; and
- (C) demonstrate appropriate garment repair techniques.

(10) Concepts and skills related to commercial care of clothing. The student shall be provided opportunities to:

- (A) demonstrate procedures to receive, mark, and identify laundry or dry cleaning;
- (B) determine appropriate laundry and dry cleaning procedures;
- (C) demonstrate safety and sanitary procedures while laundering, pressing, or dry cleaning;
- (D) demonstrate commercial laundry or dry cleaning techniques; and
- (E) demonstrate pressing procedures.

GUIDE TO ESSENTIAL ELEMENTS

Apparel and Textiles Production, Management, and Services (TAC 75.83)

Apparel and textiles production, management, and services (two units) shall include the essential elements in this subsection. All courses shall include the essential elements in paragraphs (1) and (2) of this subsection. In addition, training programs emphasizing apparel and textiles production shall include the essential elements in paragraphs (3) – (5) of this subsection, training programs emphasizing apparel and textiles management and services shall include the essential elements in paragraphs (6) – (8) of this subsection, and training programs emphasizing apparel and textiles services shall include the essential elements in paragraphs (9) and (10) of this subsection.

Required Essential Elements	Related Chapters
(q1A) Demonstrate how to function effectively in routine operations.	1
(q1B) Demonstrate interpersonal qualities which lead to job success in apparel and textiles industry.	2
(q1C) Describe techniques for maintaining good customer relationships.	3
(q1D) Demonstrate safety practices and sanitation procedures.	4
(q1E) Apply organizational goals, policies, and procedures.	5
(q2A) Apply correct textiles and apparel terminology.	6
(q2B) Identify textile characteristics and care.	6
(q2C) Relate textile characteristics to garment design, construction, alteration, and repair.	6
(q3A) Select fabrics and notions suitable for garment design.	7
(q3B) Apply design elements when designing, constructing, or altering apparel.	8
(q3C) Apply appropriate sewing and pressing techniques in garment construction.	9
(q3D) Apply safety procedures while operating equipment.	4
(q4A) Apply appropriate procedures when measuring for custom garment.	10
(q4B) Apply pattern alteration procedures to ensure custom fit of garment.	11
(q4C) Apply unit construction techniques.	12
(q5A) Describe considerations for fitting garments.	13
(q5B) Demonstrate garment adjustments following alteration markings.	14
(q5C) Demonstrate appropriate garment repair techniques.	9
(q6A) Apply design elements when designing, constructing, or altering apparel.	8
(q6B) Identify signs of quality in clothing and accessories.	15
(q6C) Illustrate coordination of clothing and accessories for infants, children, or adults.	16

Required Essential Elements	Related Chapters
(q7A) Apply marketing techniques when assisting with promotions and special events.	17
(q7B) Prepare fashion displays.	18
(q8A) Demonstrate safety practices while using and storing equipment.	4
(q8B) Demonstrate appropriate use and care of sewing or pressing equipment.	19
(q8C) Demonstrate sewing, repairing, or pressing techniques.	9
(q9A) Describe considerations for fitting garments.	13
(q9B) Demonstrate garment adjustments following alteration markings.	14
(q9C) Demonstrate appropriate garment repair techniques.	9
(q10A) Demonstrate procedures to receive, mark, and identify laundry or dry cleaning.	20
(q10B) Determine appropriate laundry and dry cleaning procedures.	21
(q10C) Demonstrate safety and sanitary procedures while laundering, pressing, or dry cleaning.	22
(q10D) Demonstrate commercial laundry or dry cleaning techniques.	21
(q10E) Demonstrate pressing procedures.	19

1

The Textiles and Apparel Industries

ESSENTIAL ELEMENT

- Demonstrate how to function effectively in routine operations.(q1A)

OBJECTIVES TO ACHIEVE

- Describe the size, scope, and importance of the textiles and apparel industries in today's society.
- Explain how the textiles and apparel industries began and developed in the United States.
- Review the role of imports, exports, and technology in the textiles and apparel industries.
- List routine operations that entry-level employees perform in the textiles and apparel industries.
- List examples of routine operations in the areas of clothing services, clothing production and management, and textiles and clothing design.
- Identify general routine tasks that textiles and apparel employees may perform.

Textiles and apparel are basic to human life. Clothing is the most obvious product of the textiles and apparel industries. There are many other uses for textiles. The textiles and apparel industries contribute to the health of the United States. In 1987, more than two million people were employed by the textiles and apparel industries. In the same year, more than 5,000 textile companies and approximately 20,000 apparel firms existed in the United States. Forty-eight states had textile plants, fifty states had apparel manufacturing plants, and forty-eight states produced natural or manufactured fiber. There are heavy concentrations of these industries in all parts of the United States.

The word ***textiles*** is used to describe materials such as fibers and yarns that can be used to make fabric. Cloth constructed from these materials may also be referred to as textiles. ***Apparel*** is the word used to describe items of clothing produced from various textile products. Using these definitions, it is apparent that the textiles and apparel industries employ people in a variety of jobs and produce many types of products.

Textile products are used in various ways in our society besides in the production of apparel. For example, tires are made from textile products. Textiles are used in the production of such consumer products as tea bags, home furnishings, and food packages. Many textile products are used in fields of high technology such as medicine. Artificial arteries, used by surgeons to prevent blood clots and rejection of transplanted hearts, are made of knitted polyester. The Department of Defense uses approximately 10,000 items that are made entirely or partially from textiles. Some jet airplane bodies are made of carbon fibers. From these examples, it is apparent that textiles play an important role in society.

HISTORY OF THE INDUSTRY

The textiles industry has been important to the growth of the United States since colonial days. In the late 1700s, cotton was produced in the South and was primarily exported to England. Samuel Slater, an English mechanic, immigrated to America and built a textile mill in Rhode Island based on plans he had memorized while working with textile mills in England. The textiles industry grew in New England and expanded to the South during the 1800s.

A variety of other inventions such as Eli Whitney's cotton gin helped the textiles industry develop into a major part of life in the United States. In 1813, Francis Lowell introduced the ***power loom*** which allowed weaving to be done more efficiently in textile mills by larger numbers of people. An invention of Walter Hunt, the ***sewing machine***, was significantly improved by Elias Howe in 1845. In 1846, Isaac Singer began mass producing a sewing machine that used a foot treadle. An electrically-powered sewing machine was introduced in 1921. In 1884, the first manufactured fiber, ***rayon***, was produced. ***Nylon***, another manufactured fiber, was produced in the 1930s followed by polyester, acrylic, and other fibers.

The fashion industry in the United States began in the area around New York City. During the 1890s, large numbers of immigrants arrived in New York City from various countries. Many of the immigrants were hard workers and skilled laborers in jobs relating to the fashion industry. They were willing to accept employment for low wages and were often employed under poor working conditions. Small factories were developed which became known as ***sweat shops***. As unions were formed and workers began striking, laws were passed to protect workers. Most owners of sweatshops were forced to improve working conditions. With its status as a major port and as the center of major fashion news, New York City continues to be the largest marketplace for fashion in the United States.

Retail began in the United States with general mercantile stores which provided many different types of merchandise to customers. The industrial revolution allowed more products to be produced which encouraged increased selling to customers. The industrial revolution also employed workers in jobs that allowed them to make more money. As a result, a middle class developed in the United States. Department stores opened in cities where large numbers of people moved to gain employment. A new philosophy of serving the customer developed. Apparel was a major merchandise category sold in these department stores. As the history of retail evolved, other types of stores developed. Specialty stores, chain stores, and discount stores are examples of retail organizations that have influenced the apparel industry.

Imports and Exports

By the late 1800s, Japanese cotton mills began importing cotton fabrics to the United States. ***Imports*** are goods that are received in a country from another country. ***Exports*** are goods that are shipped from one country to another country. During the depression, the Japanese cotton imports caused serious economic problems for the United States by adding to the unemployment problem experienced by Americans. President Franklin Roosevelt appointed a Cabinet-level committee to recommend solutions to the unique problems of the American textile industry. The first quotas on Japanese textiles and apparel were enforced by the United States in 1937 in an attempt to keep imports in balance with exports to other countries. When the value of goods imported into a country is more than the value of goods exported from a country, a ***trade deficit*** is created. Trade deficits have serious negative economic results.

Presidents Dwight Eisenhower, John Kennedy, Richard Nixon, and Jimmy Carter all had important roles in developing agreements with foreign countries regarding exports of textile goods to the United States. Rules for textile and apparel trade between fifty nations are stated in the Arrangement Regarding International Trade in Textiles, commonly known as the ***Multifiber Arrangement (MFA).*** This agreement was first signed in 1974 and has been renewed since then.

Employees in many developing countries in the world earn much lower wages than employees earn in the United States. These countries with lower wage scales are able to produce textile and apparel products at lower costs than the same items can be produced in the United States. As a result, there has been a great increase in the number of textile and apparel products being imported into the United States in recent years. In many cases, consumers are able to buy imported textile and apparel goods at lower prices than they can buy goods made in the United States. Representatives of the textiles and apparel industries feel that the import problem is a major threat to the industries in the United States. Legislators and industry representatives continue to search for solutions to the problem. The industries attempt to promote U.S. textiles and apparel products to American consumers.

Technology in the Industry

In order to compete with competition and increase efficiency, the textiles and apparel industries invest each year in new equipment. Today, many textile mills, manufacturers, and retail operations use high-technology equipment. ***Technology*** involves applying knowledge through use of inventions or methods to improve a process. High-speed spinners, electronic sensors, shuttleless looms, and high-speed looms are technological developments that have made United States firms more competitive.

Technology can speed production, improve the quality of products, and increase accuracy. ***Computer-aided design (CAD)*** of garments is now used by many companies. CAD makes it possible for preassembly jobs, such as certain parts of the pattern-making process, to be computerized. Traditionally such jobs have been done manually and required great skill. Most apparel manufacturers now use automated systems to lay out patterns for cutting garment pieces. Some manufacturers have totally automated manufacturing systems called ***computer-aided manufacturing (CAM).*** CAM allows jobs such as the cutting of garment pieces to be computerized.

There are several advantages to using CAD and CAM systems in apparel design and manufacturing. One advantage is that a business can save money on the amount of fabric used because of the efficiency and accuracy of the CAD system. A CAM system requires fewer people and allows employees with less experience and skill to perform tasks that previously required a high level of skill. The speed of the CAD and CAM systems is another advantage. Many businesses have reported a substantial savings in production costs as a result of using CAD and CAM systems. Some businesses have linked CAD and CAM to create CAD/CAM systems that involve both computerized design and automated manufacturing.

Computerized information systems are used to run automated order processing, warehouse, and shipping activities. One example involves a major fiber company, a fabric company, and an apparel company being linked by computer. The ordering of goods, scheduling of production, and distribution-management systems are all coordinated through use of a computerized system. As a result, the retailer's inventory levels are reduced by fifty percent. The retailer is able to receive merchandise as soon as five days after ordering compared to the previous response time of over thirty days. Retail operations have also increased their efficiency by use of items such as scanning devices and computerized cash registers which provide improved customer services.

ROUTINE TASKS

Workers are employed in the textiles and apparel industries in a variety of occupations. Regardless of the occupation or area of employment, all employees complete some routine tasks. Understanding the importance of such routine operations helps employees carry out functions that are vital.

Clothing Services Routines

Individuals who own custom sewing businesses charge for the service of sewing garments for the public. Garment alteration businesses repair and alter ready-made garments. Dry cleaners clean, press, and repair garments. Wedding consultants and fashion consultants are other employees who provide clothing services to the public. It is important for the owner of a business that provides clothing services to be thoroughly organized before making customer contacts. Good organization makes routine operations easier to manage.

An example routine job of a dry cleaner employee might be to mark all garments to be laundered and dry cleaned. It is very important that an employee marks each garment immediately upon its receipt from the customer so that no mistakes result and no garments are misplaced. It is especially important for the person marking garments to follow specific procedures used by the business so that each customer receives satisfactory service.

Clothing Production and Management Routines

There are a variety of career opportunities in the areas of clothing production and management. Garment sample makers, pattern makers, and pattern graders contribute to the basic apparel production process. A variety of jobs exist in the cutting and sewing rooms of an apparel manufacturing business. Example jobs include hand or machine spreader, marker, cutter, sewing machine operator, and finish presser. Occupations in the shipping department of an apparel manufacturing business include packer and shipper.

Clothing production and management jobs involve a variety of routine operations. An example routine job of a sewing machine operator is sewing pockets on a large number of garments. Although the repetition of the job may seem boring, a job that allows an individual to use skills that are repeated helps the person improve those skills. The repetition of the job does not mean that the job is an unimportant one. Each part of a garment must be constructed well in order for a high-quality garment to be produced.

Textiles and Clothing Design Routines

The field of textiles and clothing design involves jobs that require various levels of training. Example jobs include cutter, grader, finisher, trimmer, clothing designer, textile designer, researcher, and textile product developer. Jobs at all levels require completion of routine tasks. The fashion or textile designer must conduct research in order to develop ideas for designs. Such research may involve routine work such as searching through museums, libraries, costume collections, periodicals, and other sources in order to identify ideas that can be used in designing clothing and other textile products.

Merchandising, Fashion, and Retailing Routines

The areas of merchandising, fashion, and retailing offer many opportunities for employment. Example jobs include window and store display person, fashion coordinator, buyer, fashion model, salesperson, stock clerk, and department store manager. As with other occupational areas, employment in merchandising, fashion, and retailing involves implementing a variety of routine tasks. An example routine task for a salesperson is collecting clothing items from fitting rooms and returning them to the selling floor. Keeping accurate records is another important routine of salespeople. A buyer must remain aware of the most current fashion trends and be able to successfully project future trends. Listening to consumers and observing their buying habits will help in making wise purchases that will appeal to consumers.

Sales and Returns – Retail salespersons frequently manage sales and returns of merchandise. The most common sales transactions are cash, charge, and layaway sales. Most stores consider checks to be cash sales. Some stores also sell gift certificates. Returns may involve an exchange or a refund of the customer's money. In some cases, a customer may owe an additional amount for a different item he or she selects.

When a salesperson receives payment for merchandise sold, the transaction is considered a ***cash sale***. When the customer uses a check to pay for merchandise, most businesses require the salesperson to check the identity of the customer. One method used is to request to see the customer's driver's license in order to compare the signature on the check with the signature on the license. Usually the salesperson also records the customer's driver's license number on the check. Some businesses require the salesperson to have checks verified by a department manager.

When a customer receives merchandise and agrees to pay for it later, the transaction is called a ***charge sale*** or ***charge***. A business may allow customers to open a charge account with the store and may provide each customer with a charge card for use each time a charge sale is transacted. Many retail businesses also accept major credit cards. For each charge sale, the salesperson is expected to complete a special form that describes the merchandise being purchased. In addition, the salesperson must have the customer place his or her signature on the form. By signing the form, the customer legally agrees to pay for the merchandise. Some small stores allow customers to charge merchandise by simply signing a sales check or sales slip which serves as an agreement to pay later for the goods or services.

A ***layaway sale*** involves the store taking an item out of stock and holding it for a customer who agrees to pay for it over a specific period of time. Layaway is considered a customer service. The customer is usually required to make a deposit on merchandise placed in layaway. The balance of the purchase must usually be paid within two, three, or more months. If the customer does not complete the payments within the specified time period, the store returns the item to stock.

A ***COD sale*** occurs when a customer agrees to make full payment when merchandise is delivered. COD is an abbreviation for cash on delivery. Fewer COD sales are made now since charge accounts have become available which allow people to shop without actually having cash with them.

A customer may wish to return a purchase because the merchandise is defective or because he or she made a mistake in selecting the merchandise. Stores accept returns of defective merchandise unless the merchandise was sold "as is" during sales. Each store may set its own policy regarding returns of merchandise for other reasons. Many stores set a time limit, such as ten days or two weeks, within which returns will be accepted. The customer may be required to present a sales receipt when returning merchandise. Some stores will refund a customer's money when a return is transacted. Other stores may set a policy to give the customer credit that may be used later in purchasing other merchandise. In this case, the customer may receive a ***credit slip***, a completed form noting the amount of credit the customer may use to purchase merchandise. A few stores only allow the customer to exchange the merchandise for other merchandise.

General Routine Tasks

Office Work and Paper Work – Operating a business of any kind involves record keeping and other paper work. Having the right forms makes work easier and makes a business appear professional and organized. Keeping accurate records helps a business owner pay income tax, make social security payments, and calculate income per hour and per job.

A ***statement*** is a term used to describe a written bill. Statements of two or three colored carbonless sheets are sometimes used by businesses. Some firms use personalized statements with the name, address, and telephone number of the business printed at the top of each form. Other businesses may use a generic form. The copies of the statement are necessary for business records and for the customer to have one copy. It is important that all needed information be recorded on the statement when a business transaction is made. In some cases, employees record information by hand. In other businesses, employees use a computer to type information on statements. Some computerized cash registers print a sales receipt with detailed information so that a statement is not required.

A ***sales check*** or ***sales slip*** is a written record of a sale. Different stores use different types of sales checks. The sales check serves as a receipt for the customer and as a record for the store showing that merchandise was sold. The types of information that may be included on a sales check include the date, customer name and address, salesperson identification, type of transaction, merchandise purchased, and the price(s). It is important that new employees learn the procedure for completing a sales check if the procedure is a routine part of their jobs. In some businesses, sales checks are produced by computerized cash registers when the employee enters the needed information into the cash register. Become aware of the required information for producing a sales check at a particular business and develop a system for checking to ensure that no information is omitted.

In addition to completion of various types of paper work, some employees are required to complete other routine tasks such as filing. Each business has its own filing system and the specific system should be followed carefully to ensure that records are easy to find and use. Answering the telephone and greeting customers are two routine operations required of many employees. Chapter Three provides information regarding communicating with customers in person and by telephone.

Opening and Closing Routines – Some employees are required to perform routine operations for a business at opening and closing times. The opening and closing routines vary for each business. In a retail operation, examples of opening routines include turning on the lights, securing change for the cash register from a location such as the cashier or business department, counting change and placing it in the cash register, checking to make sure that needed supplies are available (such as sacks, plastic bags, clothing hangers, statements, and sample items), and having equipment stored in the right locations for use. Examples of closing routines include turning off the lights, counting the cash in the cash register, returning money from the cash register to the business department, and completing end-of-the-day reports and records.

Operating a Cash Register – Different stores use different types of cash registers. The type of cash register used depends on the amount of business done and how much detailed information the retailer wants to know about sales transactions. Some computerized registers allow the salesperson to record the price of the merchandise sold, the department, the classification of the merchandise, identification of the salesperson, an item description, and the type of sales transaction. After the initial training period, most employees find cash registers easy to operate.

For many years only manual cash registers were available for use in retail businesses. Now that electronic and computerized cash registers are available, fewer manual cash registers are used. However, some stores may still use manual cash register models. Computerized cash registers have many features that make the salesperson's job easier. For example, some cash registers automatically calculate the sales tax for each sale. If the cash register does not have this tax calculation feature, the salesperson must usually refer to a tax chart to identify the amount of tax the customer owes on the merchandise purchased.

Another convenient feature of some cash registers is the calculation of the amount of change the customer is owed. After the salesperson enters the amount of cash the customer is paying, the cash register will automatically subtract the amount of the sale from the amount tendered (paid) and display the amount of change owed. When cash registers do not have this feature, the salesperson must calculate the amount of change the customer will receive. Having such a feature on a cash register may reduce the number of mistakes made by salespeople.

In some cases, each salesperson is assigned a special code or key on the cash register so that the proper person will receive credit for sales made. The salesperson depresses the assigned key or enters the assigned code before entering each sale on the cash register in order that appropriate credit is given. In some cases, this method is used to calculate a salesperson's sales commission. ***Sales commission*** is the amount of money a salesperson earns from each sale. Some stores pay salespeople based on commissions and others pay salespeople salaries.

Some cash registers are part of a computerized information system that includes scanning devices. Scanners are also called optic readers. ***Scanners*** or ***optic readers*** automatically read the price of an item and enter it into the cash register. Special tags or labels must be attached to the merchandise in order for the scanner to function. When a hand-held scanner is passed over the special tag or when the item is passed over a scanner installed inside a sales desk, the scanner reads the special information on the tag. In addition to recording the cost of each item, the scanner can record what was sold so that the retailer has an automatic inventory system.

A charge purchase by a customer can be immediately added to a customer's account with a computerized cash register. A computerized system updates the store's records and eliminates the need for employees to manually post (record) charges to each customer's account. As a result, records are neat and orderly and the customer has access to his or her account information at any time it is needed.

Some cash registers are designed to print and issue a receipt automatically each time a transaction is completed. Some stores provide receipts with detailed information. A cash register receipt with information such as the date, the amount of the sale, the salesperson's identification, the department, and the type of transaction can eliminate the need for a sales check.

Even when using computerized cash registers, salespeople may make mistakes. The most common errors made involve carelessness, entering the wrong prices, and entering the wrong departments for the merchandise sold. Salespeople may enter wrong price information because of inaccurate information on the merchandise tag, lack of training on the price of one item when a special multiple item pricing sale is in effect, and lack of attention to or memory of sale advertisements. It is important for salespeople to correct mistakes made immediately. Each store has a special procedure that should be followed in correcting cash register mistakes. Some stores require a salesperson to complete a form to void the mistake so that there is a record of the mistake. Some mistakes will be expected when a person first begins using a cash register. However, continued carelessness and excessive mistakes may not be excused by supervisors.

Handling Money – As mentioned previously, one routine task of a salesperson is to obtain money at the beginning of the work day. Each business has special procedures to follow in handling money. The money placed in the cash drawer at the beginning of the business day is usually called the ***change fund***. The salesperson should always count the change fund before beginning to use it. In some stores, each assigned salesperson carries a till to the business department or cashier's office to obtain the change fund for the day. The ***till*** is the removable tray that has divider compartments for different denominations of coins and bills. In most cases, the till slides in and out of the cash drawer portion of the cash register. The till usually has a lid that should be closed when carrying the change fund to and from the business department.

The salesperson should check throughout the work day to make sure that there is enough change in the cash drawer of the cash register. Having to get more change during a sales transaction delays the customer. ***Buying change*** is the term used to describe obtaining change from the cashier or business office. The salesperson should count a specific amount of money in the cash drawer, remove the money, and close the cash drawer. The bills removed from the drawer are used to buy the same amount in needed change. After obtaining the needed change, the change is placed in the appropriate compartments in the cash drawer of the cash register.

Housekeeping Tasks – Employment in almost any job involves some routine housekeeping tasks. Example tasks include vacuuming the carpet in selling floor areas, returning sample books to appropriate locations, straightening merchandise, cleaning the work area before leaving for the day, and returning equipment and supplies to proper storage places. Most large housekeeping tasks are completed by employees hired specifically to do cleaning, repair, and maintenance work. However, completion of routine housekeeping tasks by all employees helps in maintaining an organized and attractive environment.

Inventory Tasks – ***Inventory*** is a process of counting and the sum total or results of the counting process. The term inventory may also be used as a verb to describe taking a count of items. ***Inventory management*** is a term used to describe the decision-making process regarding what and how much merchandise to carry in a store's stock. ***Stock*** is the sum total of merchandise carried by a store. When inventory is conducted carefully, a business can reorder merchandise wanted and needed by customers before the supply has been sold. When inventory management is done carelessly, a business may run out of merchandise needed and wanted by customers.

Inventory management is an important factor in the process of successful retailing. Two types of inventories are part of most inventory management systems. One inventory is an estimated count based on written records and/or computerized records from the computerized cash register system. The second type of inventory is an actual physical count of merchandise. All the merchandise documents that employees are required to complete are a part of the estimated count of merchandise in the store. Therefore, record keeping is very important and must be as accurate as possible. In addition, some employees are asked to do the physical count of merchandise.

Points to Remember

- The textiles and apparel industries produce textile and apparel products that are basic to human life. With more than two million people employed in 1987, these industries are important to the nation's economy.
- The textiles industry has been important to the United States since colonial days. A variety of early inventions such as the cotton gin, the power loom, and the sewing machine and the development of the first manufactured fibers contributed to the growth of the industry.
- New York City is the largest marketplace for fashion in America.
- Retail began in America with general mercantile stores and developed eventually into department stores, specialty stores, discount stores, and other retail forms that have influenced the apparel industry greatly.
- Imports and exports have had much impact on the textiles and apparel industries. The Multifiber Arrangement (MFA) was first signed in 1974 and has been renewed since then to aid in balancing the number of imports and exports of textiles and apparel items.
- Many developing countries are able to produce apparel more cheaply than the same items can be produced in the United States. The United States has experienced a large increase in imports during the last several years.
- Technology involves applying knowledge through use of inventions or methods to improve a process. Examples of improved technology are computer-aided design, computer-aided manufacturing, and computerized information systems.
- Workers are employed in the textiles and apparel industries in a variety of occupations. Regardless of the occupation or area of employment, it is important for employees to understand the importance of completing routine operations.
- Examples of clothing services businesses are custom sewing businesses, garment alteration businesses, and wedding and fashion consulting businesses.
- Examples of clothing production and management jobs include garment sample maker, pattern maker, and sewing machine operator.
- Examples of textiles and clothing design jobs include cutter, grader, clothing designer, and textile product developer.
- Examples of merchandising, fashion, and retailing jobs include window and store display person, fashion coordinator, buyer, fashion model, and salesperson.
- The most common sales transactions are cash, charge, and layaway sales. Salespeople should follow specific routines of the employer in order to implement sales transactions and when accepting returned merchandise.
- General routine tasks include office work and paper work, opening and closing routines, operating a cash register, housekeeping tasks, and inventory tasks.

Words to Know

apparel
buying change
cash sale
change fund
nylon
optic readers
power loom
rayon

charge
charge sale
COD sale
computer-aided design
computer-aided manufacturing
computerized information systems
credit slip
exports
imports
inventory
inventory management
layaway sale
Multifiber Arrangement (MFA)
sales check
sales commission
sales slip
scanners
sewing machine
statement
stock
sweat shops
technology
textiles
till
trade deficit

Questions for Review

1. What are examples of the variety of jobs available for employment in the textiles and apparel industries?
2. What are examples of the variety of products that are manufactured from textiles?
3. How has the textile industry grown in the United States throughout history?
4. How did New York City become the center of the fashion industry in the United States?
5. How can imports and exports of textiles and apparel goods contribute toward development of a trade deficit?
6. What are some examples of how technology has affected the textiles and apparel industries?
7. What are examples of routine tasks of employees in the area of clothing services?
8. What are examples of routine tasks of employees in the area of clothing production and management?
9. What are examples of routine tasks of employees in the area of textiles and clothing design?
10. What are the most common types of routines involving sales and returns conducted by retail employees?
11. What are the most common procedures to follow in operating a cash register?

2

Job Success in the Textiles and Apparel Industries

ESSENTIAL ELEMENT

- Demonstrate interpersonal qualities which lead to job success in apparel and textiles industry.(q1B)

OBJECTIVES TO ACHIEVE

- Discuss networking and describe different levels of training available for career preparation.
- Review example jobs, job descriptions, training requirements, and personal qualities needed for employment in clothing services.
- Summarize example jobs, job descriptions, training requirements, and personal qualities needed for employment in clothing production and management.
- Review example jobs, job descriptions, training requirements, and personal qualities needed for employment in textiles and clothing design.
- Summarize example jobs, job descriptions, training requirements, and personal qualities needed for employment in merchandising, fashion, and retailing.
- Compare various employment opportunities for home economists.
- Describe employment opportunities for and qualities of entrepreneurs.
- Identify general qualities needed for employment in any job.

The textiles and apparel industries offer many exciting and rewarding career opportunities. Some jobs allow people with high school training to be employed while they gain skills and experience. Other jobs require some special training or several years of education. As with other industries, jobs in textiles and apparel are classified in different ways because of the tasks performed by employees. Two companies may give different job titles to people with similar job responsibilities. Some companies may require special training not required by other companies.

Because of these variations in job titles and assigned responsibilities, it is impossible to list and describe all jobs existing in the textiles and apparel industries. This chapter includes general information on jobs available in these industries. It is important to recognize that employment situations vary.

When planning a long-term career, it is a good idea to seek a position that allows one to interact with people in other departments and/or other companies. Networking often helps people find the jobs for which they are best suited. ***Networking*** is the process of developing contacts or exchanging information with others in order to further one's career. The sections in this chapter group jobs into categories. Example job descriptions and types of training required are provided. The job titles listed are only examples of jobs available in the textiles and apparel industries. It should also be noted that some jobs may be placed in more than one category. For example, the job title of clothing designer may be considered part of the clothing production and management process or as part of the textiles and clothing design category. An important part of career planning is gaining a knowledge of job alternatives available.

As with any other industry, some jobs in the textiles and apparel industries do not require special training. These jobs are called ***entry-level jobs***. Other jobs require advanced training which may be received through a vocational school, a college, or an apprenticeship. An ***apprentice*** is trained by working with another person who is skilled at a particular job. In other situations, an employee may be hired in an entry-level position. After the employee gains experience and skill, he or she may be promoted to another position in the business.

Some jobs are only available to a person who has an ***associate degree*** which requires completion of two years of college. Other positions require a ***bachelor's degree***, a degree received when four years of college are completed. There are some schools that offer one to three-year programs that train people in specialized fields such as fashion design. In some cases, employers are interested in hiring people who have skills in a specific area and who have a certain amount of work experience in the area. Other positions may require a ***master's degree*** or ***doctor's degree*** from a university. These two degrees are called graduate degrees and require several years of study after graduation from college with a bachelor's degree. Jobs that require a college education or other extensive specialized training and/or experience are usually classified as professional level positions.

CLOTHING SERVICES

Clothing services is the area of employment involving services provided to customers related to the planning, selection, maintenance, and care of apparel. A wide variety of jobs are included in the area of clothing services. Such jobs may be found in different locations such as dry cleaners, laundry services, alteration and repair shops, and various types of retail firms. In addition, some clothing services jobs, such as fashion/image consultant, may be done out of a person's home.

Some jobs in clothing services involve learning specialized skills. For example, an alterationist must develop skills in sewing and using sewing equipment in order to perform alteration tasks. An alterationist must also develop the skill of identifying fitting problems. Therefore, experience is usually the best way to develop alteration skills. Working in entry-level positions may be necessary. After experience is gained, an employee may be assigned additional responsibilities and given a different job title.

Table 2.1 includes example jobs in the area of clothing services, job descriptions, and types of training usually required for the identified jobs.

Clothing Services Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
clothing services aide	assists supervisor(s) with assigned tasks	√		
alterationist	specializes in altering completed garments to improve the fit or to restyle them		√	
custom sewer	sews custom-made garments for individuals		√	
custom sewer's assistant	assists custom sewer with tasks involved in producing custom-made garments	√		
laundry or dry cleaners manager	manages a laundry or dry cleaner business and supervises employees			√
sorter	sorts laundry and/or dry cleaning when received according to required treatment	√		
marker/checker	checks and marks clothing items as they are received for proper identification and to indicate special treatment required	√		
presser	uses various types of steam machines and hand irons to press garments after they are cleaned or laundered	√		
repairer	makes minor repairs to garments before they are laundered or cleaned	√		
personal shopper	assists clients in shopping by selecting alternative wardrobe items based on client needs and wants		√	
fashion/image consultant	provides information and suggestions to clients regarding color choices, makeup, and wardrobe selections		√	
wedding consultant	provides information to prospective brides and grooms regarding wedding plans and selection of wedding apparel		√	
consultant to laundry product manufacturer	assists in testing laundry products on different fabrics and finishes in order to recommend uses of laundry products			√

1–Entry Level or High School 2–Advanced Training (School or Apprentice) 3–College or Professional Level

Table 2.1

Employees in the area of clothing services must be well organized, flexible, able to follow instructions, and skilled at specific tasks. In addition, some clothing services jobs such as personal shopper, fashion/image consultant, and wedding consultant require some creativity, awareness of fashion trends, and ability to apply design elements and principles. As with other areas of employment, jobs that involve meeting the public require fashionable grooming and neat appearance.

CLOTHING PRODUCTION AND MANAGEMENT

Clothing production is the process by which fabric is changed into finished garments for purchase by consumers. Clothing is made by either personal clothing production or industrial clothing production. ***Personal clothing production*** involves the process of custom making garments for specific customers and is done by a dressmaker or tailor. The dressmaker or tailor completes all the steps to make an entire garment. There are fewer people employed as dressmakers and tailors today than in previous years.

Most clothing produced today is made in industrial settings. ***Industrial clothing production*** is accomplished by one of three types of apparel firms–manufacturers, jobbers, or contractors. A ***clothing manufacturer*** or ***apparel manufacturer*** is a business that designs, produces, and markets garments with its own brand label. Such apparel products are known as ***branded merchandise*** and have a brand name owned by the company on their labels or hang tags. A clothing manufacturer may conduct all aspects of its operation in one plant or may be organized as a satellite operation. A manufacturer with a ***satellite operation*** has a central facility where ***piece goods*** (fabric) and other materials are received, designs are made, patterns and markers are created, piece goods are cut, and finished garments are warehoused (stored) and shipped. The actual sewing of garments may be done at several sites located around the central facility.

A ***jobber*** is a business that usually develops ideas for looks or designs, selects the fabric for the designs, and markets the finished products. Some jobbers operate using only a small office from which they contract with other businesses to carry out all phases of the production process. Other jobbers may have a facility where they make a pattern and sample garment for each design idea. The pattern, sample garment, and manufacturing specifications (instructions) are then provided to a contractor which actually produces the garment. In many cases, the finished garments are returned to the jobber for warehousing, sales, and shipping. Jobbers could not be in business without contractors.

A ***contractor*** is a business that owns or rents a building, sets up apparel production equipment, and employs people to make apparel. Contractors produce apparel for jobbers or for manufacturers who receive more orders than expected and cannot produce large enough quantities of goods in their manufacturing plants. Contractors usually require large minimum orders before contracting with a jobber or manufacturer. In addition, some retailers hire contractors to manufacture private label merchandise for them. ***Private label merchandise*** is merchandise made specifically for a particular retailer and appears in the store with the store's private label on it. The contractor who produces private label merchandise has the advantage of not needing design and sales departments since the retailer specifies the design of the garments ordered and sells the garments through its retail operations.

Towns and cities in forty states in the United States have clothing manufacturing plants. However, the women's apparel part of the industry is concentrated in New York City. Seventh Avenue (Fashion Avenue) between 17th and 40th streets in New York City is known as the ***garment district***. The state of New York has the largest number of apparel manufacturers in this country. California is the state with the second largest number of apparel manufacturers followed by North Carolina with the third largest number. Textiles and apparel manufacturers are estimated to employ 1.8 million workers, more than any other manufacturer of non-durable goods in the United States.

The apparel industry includes both small and large manufacturing operations. Apparel plants tend to be smaller in size than other types of manufacturing plants. Many companies manufacture various parts of one garment in several small plants in different locations. Most apparel manufacturing plants employ small numbers of people. For example, as few as twenty sewing machine operators may be hired for one plant. It is estimated that the average apparel manufacturing plant has about forty-eight employees. However, there are a few manufacturing operations that are very large. For example, one apparel manufacturer has one plant in Kentucky with 4,000 employees. This operation is estimated to produce about 300,000 dozen briefs and T-shirts each week. A major manufacturer of men's slacks has a large factory in Texas that employs approximately 6,000 people.

There are also operations called cottage industries that manufacture apparel. A ***cottage industry*** is a production arrangement in which a manufacturing plant is not used. The company owner contracts with individuals who sew entire garments in their homes. Cottage industries provide additional employment opportunities for dressmakers, tailors, and custom sewers.

All garments produced by a single manufacturer that look exactly alike make up one ***style***. Usually each style is assigned a number that distinguishes it from other styles produced. These numbers are called ***lot numbers*** or ***style numbers***. All of the styles designed and produced for the same selling period or season make up what is called a ***line*** or ***collection***. Because fashion changes frequently, apparel manufacturers must adapt to resulting changes in patterns, sewing operations, and ways to assemble clothing items.

Staple apparel or ***basic apparel*** includes clothing items for which demand is based more on consumer replacement needs than on wants. Example staple items include men's white underwear, uniforms, and white dress shirts. Manufacturing methods remain fairly constant for staple apparel since few changes occur in the styling of such items. Thus, producers of staple or basic apparel usually have fewer problems with changes in sewing operations, production quotas, delivery, and returned merchandise than manufacturers of fashion apparel.

Fashion apparel includes items that experience styling changes from season to season based on the wants and demands of customers. Women's apparel is influenced more by fashion changes than any other category of the apparel industry. However, other categories of apparel such as childrenswear and menswear also experience styling changes resulting in fashion merchandise.

Apparel manufacturers sell their goods to retailers who sell to customers. An apparel line is designed and produced for a ***season***, a particular time frame for the production and sales life of a collection of styles. Some manufacturers produce special lines for as many as five seasons including Fall and Back-to-School, Winter, Holiday and Resort, Spring, and Summer. Other manufacturers produce fewer lines of clothing.

A line of clothing appears in retail stores one season prior to the season for which the line is designed. For example, Fall lines are usually available in stores during the late Spring and Summer seasons. Spring lines appear in stores during the Winter season. Apparel manufacturers show their newest collection to retailers during a time period called ***Market Week***. Market Week is a time of special promotion to retailers so that orders may be received months before the merchandise appears in stores. Retailers usually order garments by the dozen and by size.

Delivery dates are specified when orders are received. Table 2.2 provides example jobs in the area of clothing production and management, job descriptions, and training requirements for the identified occupations.

Clothing Production and Management Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
tailor	makes alterations (retail stores or dry cleaners) or may sew garments to meet needs of customers by cutting, basting, sewing, fitting, and finishing		√	
dressmaker	makes women's garments such as dresses, coats, and pants according to customer specifications and measurements		√	
tailor's/dressmaker's assistant	assists tailor or dressmaker with tasks as assigned	√		
sample maker	makes a sample garment from muslin using a designer's sketch		√	
pattern maker	constructs a master pattern from a sample garment using heavy paper or fiberboard		√	
machine spreader	uses machines to lay fabric evenly back and forth across a cutting table in a factory	√		
cutter (production, hand)	cuts various garment pieces from layers of fabric spread on cutting tables in a factory		√	
assembler	collects and bundles garment pieces and accessories to make a complete garment, identifies the bundles to figure earnings of workers paid by the number of pieces they produce, and delivers the bundles to the next appropriate worker	√		
sewing machine operator	uses sewing machine of a specific type (such as single needle or double needle) to perform a specific task (such as collar stitching or pocket making)	√		
fashion designer	creates original designs for new types and styles of clothing			√

1–Entry Level or High School 2–Advanced Training (School or Apprentice) 3–College or Professional Level

Table 12.2

The personal qualities needed for jobs related to clothing production and management include attention to detail, ability to work quickly and efficiently, ability to follow instructions, and organizational skills. Jobs requiring repetition of a specific process many times a day, such as sewing machine operator, require patience and endurance. Employees involved in clothing production may be required to work in crowded working conditions and must be able to perform assigned tasks even when other workers and machinery are noisy. Some clothing production jobs such as fashion designer require a great deal of creativity. Other clothing production jobs require employees to follow detailed instructions in order to reproduce clothing designs exactly as the designer intended. Some clothing production employees are paid based on the amount of work they produce. For example, sewing machine operators are often paid based on the number of pieces they sew during a specific time period. Such employees must be goal-oriented and work quickly in order to produce enough work to earn a reasonable salary.

TEXTILES AND CLOTHING DESIGN

Textile design and clothing design are two areas of employment in the textiles and apparel industries. Several textiles and clothing design jobs overlap with jobs in the area of clothing production and management.

Job opportunities in the area of textiles and clothing design are usually found in design studios, print design studios, weaving mills, knitting mills, print plants, screen printing plants, and converters. A ***design studio*** is a business where designs are created and illustrated for textiles and/or clothing by people with creative and artistic abilities. A ***print design studio*** is a studio where designs are created and illustrated for prints that will be applied to fabrics used in clothing and other textiles products. A ***weaving mill*** is a plant where raw fiber is processed and woven into fabric. A ***knitting mill*** is a plant where fabric is produced by use of a knitting process which involves interlocking a series of loops of one or more yarns.

A ***print plant*** is a plant where patterns are applied with dyes to textile fabrics by stencils, rollers, wooden blocks, or screens. A ***screen printing plant*** is a plant where designs are printed on fabrics by one of two screen printing methods. The ***screen printing methods*** involve blocking a pattern out on a fabric mesh or screen so that when a colored print paste is squeezed through, it will penetrate the unblocked areas. A ***converter*** is a business that buys gray goods and sells them to cutters, wholesalers, retailers, and others. The converter arranges for the finishing of the fabric. ***Gray goods*** or ***greige goods*** are knitted or woven fabrics in an unfinished state (after weaving or knitting and before dyeing or finishing).

Table 2.3 provides examples of jobs available in the area of textiles and clothing design, job descriptions, and training requirements for the identified occupations.

Textiles and Clothing Design Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
sketching assistant	sketches precise technical drawings of constructed garments and attaches fabric and trim swatches mainly for designers' records, prepares artwork for presentations		√	
sketcher (assistant to designer)	sketches free-hand illustrations of designer's ideas, deals with buyers, contributes original ideas upon request		√	
sample maker	makes a sample garment from muslin using a designer's sketch		√	
embroidery designer	does detailed technical drawings of designs for lace and embroidery			√
textile chemist	specializes in research and development of new fibers and finishes and improvement of existing fibers and finishes through scientific work in a textile laboratory			√
colorist	creates various color combinations of existing textile designs		√	
screen printer	uses the screen printing process to squeeze colored print paste through fabric mesh or screen onto fabric by hand or using automated machinery		√	
roller engraver	engraves designs in copper rollers or cylinders used in the roller printing process to print designs on fabric		√	
weaver	uses a power or hand loom to interlace two yarns or similar materials so they cross each other at right angles to produce woven fabric		√	
fashion designer	creates original designs for new types and styles of clothing			√
textile designer/ textile artist	creates original artistic designs to be used in production of textile fabrics			√

1–Entry Level or High School 2–Advanced Training (School or Apprentice) 3–College or Professional Level

Table 2.3

The personal qualities needed for all textiles and clothing design jobs are similar. Employees must be well organized, flexible, fast working, and have the ability to work under pressure. Creativity and knowledge of design elements and principles are also important qualifications. Awareness of artistic principles and attention to detail are also important to textiles and clothing design employees.

MERCHANDISING, FASHION, AND RETAILING

A variety of jobs are available to people interested in merchandising, fashion, and retailing. Jobs in these areas vary from being a fashion model to being employed as a store manager of a retail business. ***Retailing*** is the selling of goods and/or services to the ultimate consumer. In general, ***retail firms*** are businesses that obtain over fifty percent of their income from sales to the ultimate consumer. The ultimate consumer is the person who buys goods for personal use or for use by his or her household. The two primary goals of all retailers are to satisfy the consumer and to make a profit.

There are a variety of different types of retail stores. A ***specialty store*** sells one category or related categories of merchandise to a special market of people. An example of a specialty store is a store that sells only fashion accessories such as costume jewelry, handbags, hosiery, and belts. A ***department store*** is a business that sells a wide range of merchandise lines including home furnishings, apparel for the family, and household linens and dry goods. Department stores sell a variety of textiles and apparel related goods in addition to other categories of merchandise. Discount stores have become more popular during the last few years. A ***discount store*** also sells a wide range of merchandise but emphasizes lower prices in order to attract special groups of customers.

Merchandising may be defined in many different ways. ***Merchandising*** is viewed as all the activities involved in the buying and selling of merchandise and includes finding customers and providing them what they want, when they want it, at prices they can afford, and at prices they are willing to pay. Merchandising mainly includes the steps taken internally by a retail organization to present merchandise to the customer so that a profit will be made. To be successful, the merchandiser should have the right merchandise at the right place at the right time in the right quantity and at the right price. These five conditions are sometimes referred to as the "five rights" of merchandising. Different stores may be organized in various ways but merchandising is an important and necessary function for all retail firms.

Fashion is the prevailing style accepted and used by the majority of a group of people at any given time. Different groups often adopt different fashions, and fashions are often classified according to the group to which they appeal. ***Haute couture***, a French term meaning the finest dressmaking, refers to fashion from a designer who creates a collection of original designs that are then duplicated for individual customers on a made-to-order basis. Such fashions are very expensive and are purchased by an elite group of customers. These haute couture fashions are also referred to as ***high fashion*** meaning styles or designs accepted by a limited group of fashion leaders, people who are the first to accept fashion change. ***Mass fashion*** refers to styles and designs that are widely accepted by most people. Such fashions are produced and sold in large quantities at lower prices than high fashion. The area of employment referred to as the ***fashion industry*** includes jobs related to promoting and/or selling fashion apparel and related fashion merchandise (such as cosmetics).

The skills and experience gained by people employed in merchandising and retailing can be used to gain jobs in other areas of retailing.A clothing salesperson learns personal selling skills that would assist in obtaining employment involving sales of other merchandise such as home furnishings or even automobiles. Merchandising and retailing provide a broad base of experience that can qualify people for employment in many different fields. Table 2.4 provides information on example jobs available in the area of merchandising, fashion, and retailing; job descriptions; and training requirements for the identified jobs.

Merchandising, Fashion, and Retailing Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
stock clerk	receives, unpacks, and prepares merchandise for display on selling floor; restocks selling floor as assigned; maintains stock area(s)	√		
salesperson or sales associate	uses personal selling techniques to determine each customer's needs and to persuade the customer to purchase specific goods or services to fill those needs	√		
buyer	purchases merchandise for store, maintains balanced stock desired by the store's customers and stock that is consistent with store's image, follows up on orders, and organizes trips to market			√
window and/or interior display person	plans and executes window displays and/or interior store displays to promote merchandise		√	
department manager	supervises department's employees, completes departmental reports, serves as department buyer in some stores		√	
general merchandise manager	oversees the buying, merchandising, and selling of goods for a store or group of stores in a manner consistent with the basic objectives of the firm			√
marketing researcher	coordinates projects to gather information on consumer opinions, preferences, and feelings regarding specific products and services, recommends ways to improve the marketing of merchandise			√
fashion coordinator	keeps informed of fashion trends and developments and acts as a source of fashion information in an organization			√
fashion reporter	reports fashion news for magazines, newspapers, and broadcast media			√

1–Entry Level or High School 2–Advanced Training (School or Apprentice) 3–College or Professional Level

Table 2.4

Employees involved in fashion buying and merchandising jobs must have maturity, a high energy level, flexibility, ability to make decisions, willingness to take risks, and self-confidence. In addition, buyers and merchandisers must be goal-oriented, be self-disciplined, and have excellent grooming and fashion sense. A management employee should have a good memory, good handwriting, an outgoing personality, a fashionable appearance, physical stamina, and good communication skills. Ability to work with other people and leadership skills are also necessary traits for success in management. Since some merchandising employees make presentations, these individuals must have good speaking voices and possess poise. Employees in sales must be competitive, goal-oriented, energetic, and be able to communicate clearly. In addition, employees in the area of merchandising, fashion, and retailing profit from having a good knowledge of textiles, style, and current fashion trends.

PROFESSIONAL HOME ECONOMICS OCCUPATIONS

The term ***home economist*** is a general term used to describe a person with at least a bachelor's degree in one area of home economics. Besides the professional level jobs previously identified, there are a variety of home economics occupations that require knowledge and training related to textiles and clothing. A home economics teacher is a professional with at least a bachelor's degree in vocational home economics education. Many home economics instructors teach classes in different subject areas of home economics including textiles and clothing. Thus, a basic knowledge of textiles and clothing subject matter is necessary for any home economics teacher. Home economics professionals who teach at colleges and universities are usually required to have a master's degree and a doctor's degree. In some cases, these teachers specialize in teaching one area of home economics such as textiles, clothing, and merchandising. Such professionals are also usually required to conduct research in areas of interest related to their teaching fields.

Home economists hired by the Cooperative Extension Service teach subject matter related to textiles and clothing in addition to other home economics subjects. These home economics professionals provide instruction in formal settings such as classrooms and informal settings such as community buildings and homes. They also present radio and television programs, work with organized groups of youth and adults, and develop educational materials. Extension professionals must be well-organized, be able to work well with people, and have a thorough knowledge of home economics subject matter. In most states, an Extension home economist must have at least a bachelor's degree in one area of home economics.

Some companies hire home economists as consultants. For example, a retail firm might hire a home economics specialist for a temporary time period to make recommendations regarding store layout and visual merchandising. Such temporary assignments are often called freelance work. ***Freelance work*** is done by professionals who are not employed on a regular basis but who are hired to complete specific assignments.

In some cases, companies hire home economists as consultants in full-time, permanent positions. Different companies attach different titles to these jobs. For example, a consultant for a pattern company might be called a consumer relations representative. This professional might answer customers' questions about the company's products and services, provide information to customers on clothing construction, and develop educational materials to promote the company's products and services. A sewing machine company might hire a home economist as an educational representative to develop and present training programs for retailers who sell the company's sewing machines and educational programs for customers. Some clothing manufacturers hire home economists to promote their

Sometimes home economics professionals are hired in jobs that combine home economics and another subject area such as science. For example, an organization called the International Fabric Care Institute hires professionals with training in textile chemistry. These professionals test and evaluate dry cleaning chemicals, train and update dry cleaning professionals, and educate consumers. Some individuals with strong educational backgrounds in home economics and business find that they have more employment opportunities because of the combined subject matter. Home economists with training in advertising or communications may be hired by broadcast media firms, newspapers, advertising firms, and other communications-related employers.

There are a variety of organizations, associations, and institutes related to the textiles and apparel industries which provide employment opportunities to home economists. In most cases, these home economists represent the organizations and must have poise and the ability to make presentations to groups. Research laboratories in colleges, universities, manufacturing plants, and research centers sometimes hire home economics professionals to conduct research related to textiles and apparel. Research home economists must be able to enjoy working in laboratory settings, have good analysis skills, and be willing to attend to details.

ENTREPRENEURSHIP

An ***entrepreneur*** is a person who owns and operates his or her own business. An entrepreneur usually sells a new product or service. Entrepreneurs are usually hard workers who believe in the free enterprise system. ***Free enterprise*** is the freedom of individuals to organize and operate businesses for profit in a competitive system without governmental interference. Free enterprise is a characteristic of ***capitalism***, the economic system of the United States. Under capitalism, most production means are owned by private citizens. In a free enterprise system, entrepreneurs can earn profits by taking the risk of investing ***capital*** (cash) in goods used to produce goods or provide services. Capital is usually used to buy items such as furniture, equipment, machinery, buildings, fixtures, operating cash, and supplies. The ultimate goal of an entrepreneur is to make a profit. The entrepreneur risks both failing and losing his or her initial investment.

Most businesses in the United States are organized as either a sole proprietorship, a partnership, or a corporation. The ***sole proprietorship*** is a business owned by one person. A ***general partnership*** is a legal business relationship in which two or more individuals share responsibilities, resources, and profits equally. A ***limited partnership*** is a legal business relationship in which, according to a written agreement, some owners have a limited liability for business debts and are not involved in day to day operation of the business. These individuals are sometimes known as ***silent partners***. A ***corporation*** is a legal business relationship in which a group of persons join to create an entity treated by law as a separate individual. Through its officers, the corporation makes contracts, conducts business activities, and assumes responsibility for debts.

One primary goal of businesses is to satisfy consumer demand for goods and services. Business functions include production of raw materials, manufacturing, wholesale operations, and retail sale to consumers. Small businesses are involved in all functions of business, but they primarily provide products and services to consumers through retail sale. At the retail level, many small businesses are franchises. A ***franchise*** is a right or license granted to an individual or group to market a company's goods or services. A ***franchiser*** grants a franchise and offers a proven market strategy for a product, service, or method. A ***franchisee*** is a person or group to whom a franchise is granted. Usually, a franchisee invests capital in exchange for the expertise and widely-known product image of the franchiser. Often the fee includes the cost of inventory with which the franchisee begins business. Many apparel specialty stores are operated as franchises.

In some cases, entrepreneurs develop an idea for a product or service related to textiles or clothing and decide to create a business. It is important for the product or service to be one that is wanted or needed by enough people that the business can survive and eventually make a profit. Some entrepreneurs start their businesses at home and expand later as the businesses grow. An example entrepreneur is a home economist who recognized the need for how-to books for home sewers and published a series of books on fitting problems commonly experienced by home sewers. Another example is an individual who designed a children's garment that can be lengthened as a child grows. The garments are produced and distributed to retailers who sell children's clothing.

Successful entrepreneurs are usually characterized by the following traits:

- individualism and initiative
- a pioneering spirit
- willingness to take a risk
- desire for self expression
- persistence
- creativity and inventiveness
- technical knowledge of how to operate a business
- ability to survive financially if emergencies occur
- patience to wait until the business becomes successful
- ambition, energy, and drive
- ability to make decisions
- ability to take full responsibility for decisions
- realistic expectations about the amount and types of work required
- ability to communicate
- resources to survive with lack of income

GENERAL QUALITIES NEEDED FOR EMPLOYMENT

There are many qualities employees need in any job in order to be successful. Employers look for these personal traits when people apply for jobs. Employers also consider these qualities when evaluating employees after they are hired. A person's failure to keep a job is often due to a lack of desirable personal traits rather than to a lack of job skills. Personal qualities can be developed and improved if a person makes a sincere effort. Honest self-evaluation can help a person determine strengths and weaknesses. Honest self-criticism often leads to employment success.

Appearance

All employees can profit from having a good appearance. It is especially important for employees who meet the public to pay careful attention to having a fashionable and neat appearance. When selling, merchandising, and promoting apparel, it is particularly important that employees make a good impression on customers. To develop a positive and pleasing appearance, use the following guidelines:

- Check clothing and general appearance before going to work.
- Make needed repairs to clothing on a regular basis.
- Stay aware of fashion trends and choose clothing that is fashionable.
- Choose sensible clothing that is appropriate for the employment situation.
- Select clothing that fits properly.
- Have hair cut or trimmed on a regular basis in an appropriate style.
- Wash hair as needed to maintain cleanliness and style hair daily.
- Apply moderate amounts of makeup to a clean face, if female.
- Shave and/ or neatly trim beard or mustache, if male.
- Make regular visits to the dentist.
- Maintain fresh breath and clean teeth by brushing, flossing, and practicing dental hygiene.

- Keep hands cleaned and nails well manicured.
- Take a bath or shower daily and use a reliable deodorant.
- Select sensible shoes that are kept clean and in good repair.
- Maintain proper posture when sitting, standing, and walking.
- Make a habit of smiling.

Vocal and Communication Skills

Although each person is born with a high, medium, or low voice, some voice characteristics can be changed. Making presentations in class and having teachers and other students critique one's vocal and communication skills helps a person improve. Learning to pronounce words correctly, using correct grammar, and becoming familiar with terms used in a particular job setting are important guidelines for success. Being aware of the loudness of one's voice and avoiding loud talking in a job situation will be appreciated by other employees, supervisors, and customers. However, it is also important that employees speak loudly enough to be heard and use a pleasant tone of voice. Appropriate use of communication and vocal skills is one of the most important interpersonal qualities needed by employees in all job settings.

Cooperation

Cooperation involves willingness to listen to other people's views and opinions and to work toward common goals. Employees should become familiar with and follow the rules and policies of their employers. Willingness to complete all assigned tasks with a positive attitude is another characteristic of a cooperative employee. Even if personality problems exist between two employees, it is important for both individuals to avoid petty differences and work together as well as possible. Willingness to cooperate with co-workers and supervisors without insisting on doing things a particular way contributes to a positive work environment for everyone.

Positive Work Habits

From the first day on a job, an employee should attempt to set good work habits. Handling and using equipment carefully is an important trait that shows respect for the work environment. Being prompt about completing assigned tasks and staying busy while at work are good habits to form. An employee who is willing to accept new or more efficient work techniques shows the employer that he or she wishes to develop good work habits. Showing interest in and enthusiasm for assigned tasks improves one's attitude and results in a better environment for others. Employees should avoid allowing themselves to become bored and easily distracted. Becoming aware of annoying personal habits such as loud laughing, gum chewing, or fingernail biting can help in correction of such habits.

Accuracy, Courtesy, and Initiative

Being accurate means following procedures correctly without supervisors having to repeat instructions. Paying attention to details rather than being careless in one's work habits helps in developing accuracy. Courtesy involves being polite and thoughtful to customers, other employees, and supervisors. Respecting the desires, interests, and opinions of co-workers is also a sign of courtesy. Initiative involves willingness to observe jobs that need to be done and doing them without being told. When an employee is assigned a leadership task, it is important to show leadership without being overbearing or arrogant. The person who continually tries to do the best possible job tends to be successful in reaching goals. Willingness to tackle ordinary and unusual tasks is necessary in the development of initiative.

Dependability, Honesty, and Promptness

A supervisor should be able to depend on an employee's performance, honesty, and promptness even when the employee does not feel well. Dependability means showing consistency in following through with tasks and responsibilities. Being able to work under pressure without becoming nervous, irritable, inefficient, or very upset shows dependability. Maintaining high standards and producing quality work, even when work is boring, is another sign that an employee is dependable. Honesty involves maintaining high ethical standards, telling the truth, and handling the employer's possessions and money with care. Dishonesty is a common reason for dismissing employees. Promptness means being on time and completing assigned tasks on time. Arriving at work on time and being ready to begin work immediately are indications that an employee is prompt. It is important for an employee to call as early as possible when he or she is unable to go to work.

Self-control

There are times in any job situation when problems occur and it may be difficult to remain calm. However, a successful employee keeps his or her temper under control and avoids unpleasant confrontations with customers, other employees, and supervisors. Trying to maintain a pleasant disposition helps in self-control. Pausing to think before speaking or taking rash actions also helps a person to control himself or herself. Learning to remain calm in difficult situations is an important trait for any employee. Working hard to perform well and obtain the respect of supervisors and co-workers makes self-control easier. Learn to accept constructive criticism and remain friendly. These practices help a person in developing a pleasant temperament.

Positive Attitude

A positive work attitude involves thinking about work in a favorable manner. It is easier to secure and to keep a job if one has a positive attitude. An employee expresses a positive attitude by showing enthusiasm and willingness to learn. An important attitude to develop is loyalty to the employer. A loyal employee is concerned with the quality of merchandise and services provided to customers. Following the rules and policies of the business is a part of being loyal to one's employer. An attitude of being open-minded helps any employee accept suggestions and constructive comments from supervisors. Avoid gossiping about other employees or supervisors. Negative comments about other people tend to cause the person speaking and those listening to develop a negative impression of the person discussed. When a person develops a negative attitude, it is often difficult to be open-minded and fair toward other people.

Having a positive attitude toward co-workers helps everyone get along better. The ability to get along with other people influences success in any job. A friendly, sincere manner, willingness to do one's share of the work, and respect for the knowledge and skill of other employees help provide good relationships. Learn to be interested in other people and try to find something to like in each person. A genuine interest in one's job is a quality every employee should develop. A positive attitude toward the employer, other employees, and the job helps a person deliver high quality performance. There is no substitute for hard work in obtaining job success.

Points to Remember

- The textiles and apparel industries offer career opportunities for entry-level employees; individuals with advanced training through vocational schools, colleges, or apprenticeships; and people with college and graduate degrees.
- Clothing services jobs involve providing services to customers related to the planning, selection, maintenance, and care of apparel. Jobs are available in dry cleaners, laundry services, alteration and repair shops, and retail firms.
- Clothing production and management jobs involve producing basic and fashion apparel for purchase by consumers either through personal or industrial clothing production. Industrial clothing production is done through clothing manufacturers, jobbers, or contractors. Personal clothing production is the process of custom sewing garments for customers.
- Apparel manufacturers sell their goods to retailers each season and are usually involved in marketing to retailers during a time period called Market Week.
- Textile and clothing design jobs involve the development of original ideas for use in creating textiles and clothing. Jobs are available in design studios, print design studios, weaving mills, knitting mills, print plants, screen printing plants, and converters.
- Merchandising, fashion, and retailing jobs involve the buying, promotion, and selling of fashion goods. Jobs are available in retail firms and a variety of other locations.
- A home economist is a person with at least a bachelor's degree in an area of home economics. Job opportunities for home economists include teaching; employment with the Cooperative Extension Service; freelance work; consulting for companies; representing various organizations, associations, and institutes; and researching.
- Entrepreneurs are people who own and operate their own businesses. Through the free enterprise system, entrepreneurs invest capital in goods used to produce goods or provide services. Business ownership options include sole proprietorships, limited partnerships, corporations, and franchises.
- General qualities needed by employees in any job include a good appearance, good vocal and communication skills, a cooperative spirit, positive work habits, accuracy, courtesy, initiative, dependability, honesty, promptness, self-control, and a positive attitude.

Words to Know

apparel manufacturer
apprentice
associate degree
bachelor's degree
basic apparel
branded merchandise
capital
capitalism
clothing manufacturer
clothing production
clothing services
collection
contractor
converter
corporation
cottage industry
department store
greige goods
haute couture
high fashion
home economist
industrial clothing production
jobber
knitting mill
limited partnership
line
lot numbers
Market Week
mass fashion
master's degree
merchandising
networking
personal clothing production
piece goods

design studio
discount store
doctor's degree
entry-level jobs
entrepreneur
fashion
fashion apparel
fashion industry
franchise
franchisee
franchiser
free enterprise
freelance work
garment district
general partnership
gray goods
print design studio
print plant
private label merchandise
retail firms
retailing
satellite operation
screen printing methods
screen printing plant
season
silent partners
sole proprietorship
specialty store
staple apparel
style
style numbers
weaving mill

Questions for Review

1. What benefit can be experienced by a person who uses networking in the process of career planning?
2. What different levels of training may be required for employment in different jobs in the textiles and clothing industries?
3. Where are most clothing services jobs found?
4. What are the three types of apparel firms that practice industrial clothing production? What are the differences in these three types of firms?
5. What are the differences in branded merchandise and private label merchandise?
6. How large are most apparel manufacturing operations in comparison to other types of manufacturing plants?
7. What are cottage industries?
8. What is the difference in staple or basic apparel and fashion apparel?
9. Through what methods and to whom do apparel manufacturers sell their goods?
10. What personal qualities are most important for textiles and clothing design employees?
11. What are the differences in specialty stores, department stores, and discount stores?
12. What personal qualities are most important for employees in the fields of merchandising, fashion, and retailing?
13. What are examples of employment opportunities related to clothing and textiles that are available to professional home economists?
14. What different types of business ownership options exist for entrepreneurs?
15. What qualities are usually possessed by most entrepreneurs?
16. What are examples of general qualities needed by all employees?

3

Maintaining Customer Relations

ESSENTIAL ELEMENT

- Describe techniques for maintaining good customer relationships.(q1C)

OBJECTIVES TO ACHIEVE

- Identify types of customers and their motivations for buying.
- Describe the importance of maintaining a positive attitude toward employee situations and customer relationships.
- Explain how personality and appearance influence relationships with customers and identify methods for self-improvement.
- Identify basic guidelines for communicating with customers in person and by telephone.
- Analyze character traits that aid in the development of successful customer relations.
- Describe methods for completing basic sales and service transactions successfully.

Maintaining positive relationships with customers is a vital part of any successful business. Employees in retail settings (such as department and fabric stores), clothing services occupations (such as dry cleaning and alteration establishments), and custom tailoring/dressmaking businesses interact with customers on a daily basis. A ***customer*** is a person who purchases goods or services from a retailer. A ***consumer*** is the person who uses the goods or services. It is interesting to note that the customer and consumer may be one person or two different people. It is the job of the retailer to satisfy both the customer and the consumer in order to encourage repeat business and to reduce the need for merchandise returns.

With the variety of services and businesses available, customers often have a choice of where they shop or acquire services. In many cases, the factor that may attract customers to a business is the customer service provided. Employees who deal with customers may find customer relations to be both satisfying and challenging.

At times, customers make demands that seem unreasonable or accusations that are unfair. However, in a customer/business relationship, it is important for an employee to remember that serving the customer is an important function. Learning to control emotions and deal with difficult situations in a calm, controlled manner shows maturity and good judgment.

TYPES OF CUSTOMERS

Each customer is unique. However, shoppers can be categorized into groups in order to analyze their motives and behavior while shopping. ***The innovative customer*** is one who buys a new item in order to be the first to use it. This customer enjoys being a trend setter, especially when purchasing clothing. A salesperson may be able to motivate sales by showing the innovative customer new merchandise available while providing trend-setting information.

A comparison shopper is a customer who visits a store to gain information about merchandise. The customer may check prices, quality of merchandise, product availability, brand names, purchase options, and other buying information. This person does not often make purchases on the first visit to a store. A comparison shopper's business can be encouraged by good selling techniques, by offering accurate information, and by providing quality goods and service.

An ***impulse buyer*** is a customer who makes a buying decision rapidly without much thought. Most often, buyers purchase relatively inexpensive items on impulse. Placement of impulse items in a convenient location for customer appeal is often done to encourage impulse buying.

A ***follower*** is a customer who generally chooses only products with well-known reputations. Followers tend to require complete product satisfaction prior to purchase. They may be influenced to purchase an item when they learn that a respected person or close friend has bought the same product.

POSITIVE ATTITUDES

A person's self-image, relationships with others, and success in achieving goals are influenced by his or her attitude. ***Attitude*** involves one's general manner or feeling toward a situation or person. When a person has a positive attitude, goals are achieved more easily and stress is reduced. Having a negative attitude toward a particular situation or person causes problems to appear more serious than they really are. A negative attitude leads to problems in getting along with co-workers, supervisors, and customers. A positive attitude helps an employee carry out job responsibilities effectively and encourages customer satisfaction. Cooperation, loyalty, optimism, patience, respect, enthusiasm, interest, and willingness are traits that show a person has a positive attitude.

It is important for employees to treat each other with respect at all times, especially when customers are present. Customers feel uncomfortable when visiting a business where employees argue or criticize each other. Cooperation among employees helps create an atmosphere in which customers feel comfortable. Skills that improve personal relationships help employees work with each other and with customers. Figure 3.1 summarizes the importance of cooperation and concern for others in developing a positive attitude.

PERSONALITY AND APPEARANCE

Personality is the visible aspect of one's character as it is presented to others. Some people may be described as having an "outgoing" personality and may seem to find it easy to talk with others and to be friendly. Other people may be described as being shy and may seem to find it difficult to carry on conversations. Words such as enthusiastic, bubbly, and reserved are used to describe people with different personality types. Various traits combine to create an ***image*** that a person projects to others. Traits include appearance, neatness, courtesy, manners, cheerfulness, ambition, cooperativeness, honesty, sense of humor, dependability, generosity, poise, truthfulness, tact, and ability to get along with others. These and a variety of other traits cause a person to be perceived by others as having a certain type of personality.

Short Course In Human Relations

The six most important words — "I admit I made a mistake."

The five most important words — "You did a good job."

The four most important words — "What is your opinion?"

The three most important words — "If you please."

The two most important words — "Thank you."

The one most important word — "You"

The least important word — "I"

Source: Southwestern Bell Telephone Company

Figure 3.1

When accepting employment, it is especially important for a person to evaluate his or her personality traits and personal appearance in order to identify areas needing improvement. It is never too late to set personal improvement goals. Some physical traits such as height cannot be changed. However, many aspects of appearance and performance can be changed if a person is willing to make the needed effort. Personality traits that indicate a need for improvement include dishonesty, chronic unhappiness, chronic sadness, tendency to be easily offended, extreme shyness, tendency to show off, fear of relationships, rudeness, laziness, moodiness, emotional instability, and inconsideration of others' feelings. Physical traits that contribute to the projection of a negative image include poor personal hygiene, poor health practices, inappropriate or soiled clothing, and poor grooming habits.

Rather than worrying about a trait or aspect of physical appearance that is not positive, try to improve those traits that can be changed. Make a plan for self-improvement by first identifying positive traits to develop. The self-improvement plan should include reasons for developing the positive traits, a specific plan for development of the traits, and evaluation of progress toward self-improvement. Warm, friendly, and pleasant people who are well-groomed are usually most successful in establishing positive relationships. Customers enjoy being served by employees who appear to enjoy their work and who have sincere interest in assisting others.

COMMUNICATION

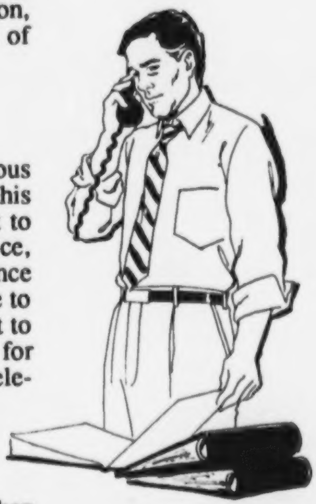
Communication is the process by which ideas, feelings, and information are shared. In order for communication to occur, a message must be sent and received. Since communication is a two-way process, the sender and receiver are both vital parts of the process. The flow of communication is influenced by various factors including attitudes, personality, perception, ideas, sensitivity, and communication skills of both the message sender and receiver.

Verbal communication includes word messages presented to others in person, through writing, and over the telephone. Verbal communication is the most obvious aspect of communicating with customers. The successful employee projects courtesy, sincerity, honesty, and other positive traits through verbal communication. Developing a broad vocabulary, using an appropriate tone of voice, and using correct grammar are important parts of verbal communication. Knowing when to speak, when to remain quiet, and when to refer problems to other employees are also important. Use of the latest slang terms should be avoided when communicating with customers. It is best for employees to use conservative speech in completing customer transactions.

Asking questions when another person's meaning is unclear improves communication. Repeating what the speaker has said helps verify if the message was understood. Practice helps an employee develop polished communication skills. Interaction with others in personal, family, and social situations helps prepare an individual for communication with customers. In addition, involvement in role play situations with other students can provide practice of verbal communication techniques.

Telephone Communication

Effective telephone communication is used in gaining or maintaining various types of employment. Each time an employee answers a business telephone, his or her voice and manner of speaking represent the business. It is important to give the best impression possible to all persons who call. The tone of one's voice, the pronunciation of words, and the pitch or intensity of the voice influence effective telephone communications. It is also very important for an employee to be organized and informed when communicating by telephone. Callers expect to receive information quickly and efficiently. Therefore, putting callers on hold for long periods of time is not a recommended practice. Techniques for use in telephone communication are included in figure 3.2.



Communication with Customers in Person

Both verbal and nonverbal forms of communication are important when dealing with customers in person. ***Nonverbal communication*** includes facial expressions, posture, movement, hand and arm gestures, attitudes, sighs, grunts, groans, and overall body language. In order to maintain positive customer relations, it is important for employees to become aware of nonverbal and verbal forms of communication that are most effective in encouraging customer satisfaction. It may be helpful to be involved in videotaped role play situations in order to identify ways to improve communication skills.

☎ Telephone Usage

General Guidelines

- Keep important telephone numbers by the telephone. Include numbers for the police, fire department, physician or hospital, emergency service, and personnel of the workplace.
- Become familiar with telephone terms such as area code, collect call, and person-to-person call; how to use the local telephone book; and any specific telephone information for the employment situation.
- Keep paper and pencil near the telephone to efficiently record messages, names, and other important information.
- Speak clearly and distinctly. Do not chew gum, candy, or food while using a business telephone.
- Focus attention on the telephone conversation and avoid unnecessary interruptions.
- Do as follows when it is necessary to leave the line:
  - Explain why the caller must be put on hold.
  - Express appreciation for the person's time when returning.
  - Check with the caller periodically if he or she must wait for several minutes.

Receiving Calls

- Answer the telephone promptly when it rings.
- Follow company policy and the supervisor's instructions regarding how to answer the telephone.
- Record the names of unfamiliar callers.
- Do as follows when taking a message:
  - Record the caller's full name. To ensure accuracy, ask the caller to spell his or her name.
  - Ask for the caller's telephone number. Repeat the number to ensure that it has been recorded correctly.
- Be courteous to individuals who have reached the wrong number.

Placing Calls

- Plan before placing a call by preparing a list of items to be discussed. Check each item off as it is discussed.
- Identify yourself and the name of the establishment represented.
- Record important points discussed during the conversation.
- Be courteous and apologize when a wrong number is reached.
- Limit personal telephone calls to emergencies and urgent matters.

Figure 3.2

To improve listening ability, concentrate on the speaker instead of planning a reply or thinking about personal matters. Avoid the habit of daydreaming instead of listening. Also avoid paying attention to distractions such as noises and other conversations. Show interest in the speaker through eye contact, by nodding that the message is understood, and by interjecting such responses as "I see," "How interesting," or "I'll do that right away."

When speaking to a customer or co-worker, it is important to show people that you like them. Use the following basic rules of conversation in order to be a successful communicator:

- Avoid talking too fast.
- Do not be afraid of silence.
- Pronounce words clearly.
- Learn to listen to others.
- Avoid total disagreement with customers when they express their opinions.
- Be tolerant of the other person's point of view.
- Avoid monopolizing a conversation by telling every detail of a story.

CHARACTER TRAITS FOR SUCCESSFUL CUSTOMER RELATIONS

Four character traits are important in maintaining good customer relationships. These traits are friendliness, cheerfulness, courtesy, and tact. These four traits are particularly important to people involved in sales. Positive character traits cannot be developed by reading about them. It is necessary to practice the use of these traits in order for them to become a part of everyday behavior. Dale Carnegie, author of *How to Win Friends and Influence People*, promoted the idea of becoming genuinely interested in people in order to influence them.

Friendliness involves displaying an attitude that is pleasant and warm. Customers enjoy entering a business where employees greet them in a friendly, natural manner. The friendliness of employees creates a relaxed atmosphere in which customers feel comfortable. Customers are more likely to make a purchase from a friendly salesperson. Friendly people establish a sense of trust with customers. Friendliness also helps establish a pleasant atmosphere by creating trust and cooperation among co-workers.

Cheerfulness involves being the kind of person others like to be around. People who are sullen and moody and complain frequently are not the types of people others enjoy. Cheerful people tend to make others cheerful. Sharing a smile with others is one of the most important rules of making friends and influencing people. A sense of humor is closely related to cheerfulness. A person with a good ***sense of humor*** has the ability to see the less serious side of issues and makes the best of difficult situations. It is important to maintain a good sense of humor in a job situation without becoming crude, rude, or inappropriately loud. A cheerful employee will respond by saying "sure" or "I would be glad to" when asked to help with unexpected work rather than grumbling or complaining. Remaining cheerful and staying busy improves the attitudes of other people.

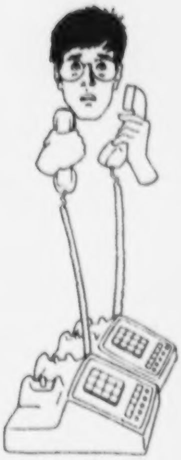
Courtesy involves the consistent use of good manners. A courteous person shows respect and consideration for others while showing a willingness to cooperate. Customers feel comfortable and appreciated when treated in a courteous manner by employees. "Please" and "thank you" are examples of courteous phrases. Discourteous habits such as interrupting people before they finish speaking or responding to another person with a rude remark should be avoided.

Tact is the ability to say and do the right thing at the right time. Employees can become more tactful by considering the customer's point of view. As an employee, think about how a customer likes to be treated and put those ideas into practice with customers. Avoid gossiping or visiting loudly with other employees while customers are waiting to be assisted. Avoid criticizing others or sharing confidential information. Never repeat the criticism and complaints of others. In a difficult situation, try to say something kind or pleasant rather than responding negatively.

Tact is very important when dealing with customers directly. For instance, an employee assisting a person who is trying on shoes that are too small should tactfully suggest trying another size by saying something like, "Let me bring you that shoe in another size. We have found that this line tends to run unusually small." Considering the customer's feelings always helps to maintain positive relations.

SALES AND SERVICE

Various types of transactions are completed in businesses. Each employee should receive training to carry out assigned responsibilities. For instance, a salesperson in an apparel retail store might be required to answer questions about merchandise, trends, and sizing; be familiar with merchandise available in the store; assist customers in trying on merchandise; help customers reach buying decisions; complete different types of purchase transactions (such as credit, cash, check, and layaway); deal with customer complaints; handle merchandise returns; refer customers to other service areas in the store; and provide various services (such as gift wrapping or delivery) as assigned. With the variety of jobs available in the textiles and apparel industries, it should be noted that each job is unique and will require an employee to carefully follow directions provided by the supervisor.



Sales Transactions

The selling process involves several important steps. The ***approach*** is the greeting used to gain the customer's attention. A good approach creates a favorable impression of the store and the salesperson. The approach should be nonthreatening, put the customer at ease, build confidence in the salesperson, and involve the customer with the store's merchandise. Different approaches may be chosen by a salesperson depending on the situation. An informative comment about the merchandise may be used. A personal approach may be used if the salesperson knows the customer's name. The salesperson may also use a service approach by offering assistance to the customer. When busy with a customer and another customer approaches, the salesperson should acknowledge the second customer's arrival and assure him or her that assistance will be available soon.

After approaching a customer, the salesperson should listen attentively to the customer to determine his or her needs. Asking a few well-chosen questions helps the salesperson determine customer needs. Asking a customer too many questions becomes annoying. The salesperson should suggest appropriate merchandise alternatives to the customer. If the customer requests an item the store does not carry, the salesperson may tactfully suggest a substitute item to fill the identified need.

The salesperson should handle merchandise properly when showing it to the customer. Demonstrating the merchandise may be necessary in some cases. A ***demonstration*** shows the customer that the item has the traits described by the salesperson. For example, allowing a customer to try on a jacket reported to be very comfortable emphasizes the positive points of the product. It is important to remember that customers do not really buy merchandise. They buy what the merchandise will do for them. Therefore, customers have increased satisfaction when shown what the merchandise will do to satisfy their needs.

The salesperson should use positive sales closers. A ***positive sales closer*** is a question used at the end of the sale to encourage an answer confirming the customer's choice of merchandise. The salesperson might ask a question such as, "How many are you needing? These are less expensive if you buy three." or "Did you like the red or the blue one best?" Remaining positive at the close of a sale both encourages the sale and maintains a pleasant relationship with the customer.

The salesperson must prepare the merchandise for the customer carefully and efficiently after a decision has been made. The accurate and efficient preparation of a sales check according to the store's policy is important to the customer and to the store. Learning how to manage different types of purchases such as cash, credit, layaway, and gift certificates is also important. Thanking the customer at the end of the transaction is a positive way to leave a lasting impression of the store.

Some employees are involved in working on a selling floor while others may be employed to transact catalog sales or telephone sales. It is important to use general guidelines for selling, follow the supervisor's instructions, and serve the customer attentively in any form of sales transaction.

Service Transactions

Some apparel and textiles related businesses sell services to customers. For example, dry cleaners sell the service of providing clean, well-pressed clothing. Alteration establishments sell the service of adjusting clothing to fit the customer's needs. Custom sewing businesses create custom-fitted garments for consumers. Any service purchased by customers must be provided promptly and efficiently in order to maintain good customer relations. Since customers pay for these services, businesses must provide the best quality of work possible and fulfill agreements with customers.

Many retail stores provide services to customers in addition to the merchandise sold in the store. Customer services that may be provided by retail stores include alterations, packaging, gift wrapping, delivery, shipping, special ordering, custom-made services, and repairs. Employees are needed in each of these and many other service areas in order to provide customers with the services they need and want. Many service-oriented occupations offering new job opportunities have developed during recent years. Trends toward consumers using more services such as wedding consultation, personal shopping services, and fashion consultation indicate the consumer's desire for service. In each of the service-oriented occupations, learning to deal with customers is vital to the success of a business.

Managing Customer Complaints

Employees may have to handle complaints from customers either in person or by telephone. It is usually easy to use a pleasant voice when a customer is courteous. However, when a customer is upset and angry, the employee must handle the situation carefully. It is important for an employee to follow the rules of the firm in dealing with complaints. It is also important for an employee to maintain a positive and pleasant composure. Showing empathy to the customer will also help. ***Empathy*** involves seeing and feeling something the way another person sees and feels. Empathy can be shown by what is said and in how the message is presented. If involved in dealing with a customer complaint, use the following suggestions to solve the problem and satisfy the customer:

- Remember that the customer is not personally attacking you.
- Allow the customer to tell his or her story without interruptions.
- Listen intently and use a sympathetic tone of voice to reassure the customer.
- Let the customer know that you are concerned by the way you speak and by your choice of words.
- Assure the customer of the firm's desire to solve the problem and suggest possible alternatives or contact a person who is authorized to deal with the problem further.
- Remain relaxed and courteous. Do not let the customer upset you.
- Remember that without customers, a business would not exist. View a customer complaint as an opportunity to prove to the customer that the business really cares about people and wishes to fulfill customer needs.

Points to Remember

- It is the retailer's job to satisfy both the customer and the consumer in order to encourage repeat business and to reduce the need for merchandise returns.
- The quality of customer service is frequently what attracts customers to a business. Controlling emotions and dealing with difficult situations in a calm, controlled manner shows maturity and good judgment.
- A person's self-image, relationships with others, and success in achieving goals are influenced by attitude. A positive attitude contributes to customer satisfaction.
- When accepting employment, it is especially important for individuals to evaluate their personality traits and personal appearances in order to identify areas that can be improved. Individuals should identify positive traits to develop and then make self-improvement plans because it is never too late to set personal improvement goals.
- In order for communication to occur, a message must be sent and then received. Work hard to overcome the barriers that discourage the communication process.
- Customer relations are improved by employees who listen to and show interest in what the customers have to say. Considering the customers' feelings in difficult or awkward situations always helps to maintain positive relations.
- The manner in which customers are approached influences their opinions of stores and salespeople. First approaches should put the customer at ease and involve him or her. If a customer is approached by a salesperson who makes him or her feel uncomfortable, the reputation of the business may be harmed and sales may be affected.
- Customers do not really buy merchandise, they buy what the merchandise will do for them. Salespeople should demonstrate proper use of the merchandise and then use positive sales closers. Merchandise must always be carefully and efficiently prepared for each customer after a purchase decision has been made.
- Learning to deal with customers is vital to the success of any business. Handle customer complaints according to the firm's policies and use complaints as opportunities to show that the business cares about its patrons.

Words to Know

approach
attitude
cheerfulness
communication
comparison shopper
consumer
customer
courtesy
demonstration
empathy
follower
friendliness
image
impulse buyer
innovative customer
nonverbal communication
personality
positive sales closer
sense of humor
tact
verbal communication

Questions for Review

1. What is the difference between a customer and a consumer?
2. What are the four types of shoppers? What are the characteristics of each type of shopper?

3. Why is it important for a salesperson to project a positive attitude?
4. What are examples of traits that combine to create the image a person projects to others?
5. Why is communication considered a two-way process?
6. What guidelines should be followed for effective telephone communication?
7. What is nonverbal communication?
8. What are examples of traits that employees should possess in order to be successful?
9. What is an example of a positive sales closer?

4

Safety and Sanitation

ESSENTIAL ELEMENTS

- Demonstrate safety practices and sanitation procedures.(q1D)
- Apply safety procedures while operating equipment.(q3D)
- Demonstrate safety practices while using and storing equipment.(q8A)

OBJECTIVES TO ACHIEVE

- Identify safety responsibilities of management and employees.
- Discuss government regulations, codes, and standards related to safety in the workplace.
- Assess various factors that contribute to safety for employees in automated office environments.
- Identify major causes of accidents.
- Explain procedures for prevention of accidents.
- Describe procedures used in fire emergencies.
- Describe procedures used in medical emergencies.

Every year, many employees experience either job-related injuries or illnesses. The manufacturing industries usually report the largest numbers of workplace injuries. Department stores also report large numbers of injuries. Manufacturers, department stores, and other textiles and apparel industries must be concerned with preventing injuries. For every 100 employees, 72.5 workdays were lost in 1988 as a result of work-related injuries. Textiles and apparel businesses and their staffs are concerned about the safety of employees, customers, and clients. Businesses are also required by federal law to provide a safe environment and a hazard-free workplace.

SAFETY RESPONSIBILITIES

Today, there is an increased potential for liability when employees and customers are injured. Liability is the state of being legally responsible or under obligation for loss or damage. When evidence shows that a business is negligent in providing for safety, the business can be held liable. ***Negligence*** is failure to use a reasonable amount of care when such failure results in injury or damage. While a business is unable to prevent all accidents and injuries, each business is expected to establish a safety program. A safety program will help prevent accidents and, in the event of legal action, serve as proof that the business made every effort to provide a safe environment. Businesses should purchase liability insurance and worker's compensation insurance for their protection against the potentially high cost of accidents and injuries.

Businesses, especially those involved in the manufacturing or cleaning processes, should prepare employees to properly handle emergencies. The enforcement of safety rules and occasional drills are important to being prepared. It is easy to get involved in the routine operations of a business and forget about emergency plans and drills. Initial reactions to an emergency greatly affect the outcome of the situation. Employees must know how to handle emergencies without hesitation in order to effectively calm people, move people to safety, avoid further injuries, limit liability, and control property damage.

Owners, managers, and employees are responsible for making sure their business operation complies with government health and safety regulations. These regulations exist to help businesses eliminate safety hazards and prevent accidents. Regulations also provide guidelines used by emergency personnel in handling emergencies. Departments in the local government and the ***Occupational Safety and Health Administration (OSHA)***, a federal agency, enforce these regulations. Agencies frequently inspect businesses to ensure that regulations are followed.

Employees of businesses can help maintain safety standards and increase personal safety in a variety of ways. Report any personal medical information that would be needed in a medical emergency to the appropriate person(s). For example, allergies to certain medicines should be recorded in each employee's work records. These records can assist health professionals in selecting medications for the victim of a medical emergency. In addition, observe safety rules and procedures. Identify and report hazards such as property damage and unsafe and insecure conditions. Employers have the legal right to discipline employees who fail or refuse to follow safety rules. However, employers are not allowed to fire or discipline an employee because he or she reports a safety hazard.

Know the location of emergency equipment and how to use it. Be aware of emergency procedures and escape routes. Wear work clothes appropriate for each work situation. For some jobs, avoid items such as scarves, neckties, loose pockets, long sleeves, dangling jewelry, wristwatches, rings, and tie aprons that can easily become caught on sharp corners or in machinery. Wear shoes that are comfortable and give needed support.

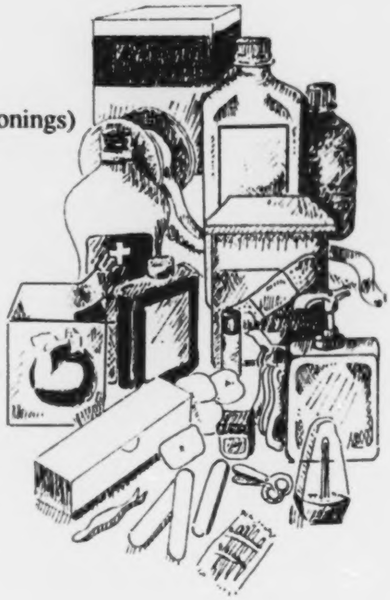
Some businesses assign employees to serve on safety committees. The committees check various departments regularly to spot hazardous conditions and unsafe work habits. Employees should report all hazardous conditions to their supervisor(s) and/or engineering/maintenance department. Hazardous conditions should be corrected immediately. Common hazards include the following:

- broken equipment, lights, locks, electric outlet covers, and glass
- lights that are burned out
- water leaks
- frayed electrical cords
- poor sanitation practices

- slippery or dirty working conditions, working surfaces, and traffic areas
- damaged floors, furniture, walls, ceilings, handrails, doors, and windows
- fire hazards
- blocked or poorly-marked fire exits
- obstruction (objects or electrical cords) in traffic areas that could cause a person to stumble or trip
- flammable items near heat sources
- inaccessible, missing, or damaged fire extinguishers
- fire extinguishers that are improperly mounted or expired and in need of recharging
- unguarded wall and floor openings

Businesses are responsible for keeping and maintaining first-aid supplies for use in emergency situations. According to the American Red Cross, ***first aid*** is "the immediate and temporary care given to a person who has been injured or who has suddenly become ill." First-aid kits at businesses should be maintained in proper locations, easy to reach, and properly stocked. A business should stock only first-aid supplies and equipment that staff members are trained and authorized to use. The employee responsible for maintaining first-aid supplies and equipment should perform a regular inventory of supplies, be informed when supplies are used, and order replacement supplies immediately. Examples of first-aid supplies and equipment that may be useful for businesses include the following items:

- absorbent cotton
- assorted bandages
- sterile gauze bandages and pads (assorted sizes)
- adhesive tape (1/2 to 1 inch wide)
- bandage scissors
- tweezers
- sterilized needles (to remove splinters)
- thermometers
- syrup of ipecac (to induce vomiting)
- activated charcoal (to absorb poison)
- epsom salts (a strong laxative for use with poisonings)
- aromatic ammonia (for fainting)
- calamine lotion (for insect bites)
- rubbing alcohol
- baking soda
- hydrogen peroxide
- petroleum jelly
- tongue depressors
- splints
- measuring spoons
- safety pins
- paper or plastic drinking cups
- washcloths
- towels
- sanitary napkins (for dressing serious wounds)
- blankets
- liquid soap
- stretcher
- flashlight
- first-aid book
- water



For increased safety, it is best for individuals to be enrolled in basic first-aid training courses before beginning employment. Many businesses require employees to receive first-aid training. Some businesses provide training for employees during work hours. It is important for employees to pay careful attention to basic first-aid procedures in order to save lives and increase safety.

GOVERNMENT REGULATIONS, CODES, AND STANDARDS

The ***Occupational Safety and Health Act of 1970*** requires employers to correct safety violations and to make the workplace free of any hazards that might cause injury or death to employees. OSHA enforces the act. OSHA standards that apply to the apparel and textiles industries relate to the following areas:

- protective devices required for each point-of-operation (the part of a machine where work is performed)
- guarding for any mechanical power-transmission machines
- electrical grounding of hand tools and other equipment
- mechanical or electrical methods for stopping textile machines
- devices to prevent machines from restarting automatically after a power failure
- prohibition on splices in electrical cords
- starting and stopping controls that prevent a worker's hand or fingers from touching any part of a machine
- clean, obstruction-free aisles and work spaces
- maintenance of all guards, safety devices, and starting and stopping devices
- proper storage of flammables (such as solvents and spot-cleaning fluids)
- excessive noise levels and dust (such as cotton dust)
- hazardous materials and lasers (such as lasers used to cut garment pieces)
- personal protective occupational safety equipment
- proper types and amounts of lighting
- insulation on steam pipes
- safety valves on pressure-reducing valves used by laundries

OSHA regulations are listed in Title 29, section 1910 of the Code of Federal Regulations, published and updated regularly by the Office of the Federal Register, National Archives and Records Administration. The Code of Federal Regulations can be found in many libraries and Title 29 of the Code can be found at local OSHA offices.

Businesses are also encouraged by OSHA to keep records on all employment-related accidents and to establish safety programs. The safety programs may involve on-the-job safety training programs or organization of safety committees. OSHA also requires that accidents causing death or injury to five or more people must be reported to the Department of Labor.

Businesses must display OSHA posters listing employees' legal rights regarding safety. OSHA also requires that employees be informed about all chemicals they use on the job. OSHA will provide safety data sheets for each chemical product used at a work site and requires that employees learn this information and become thoroughly informed about the products they use on the job.

OSHA compliance officers periodically inspect job sites and businesses to ensure that employees work in safe environments. The OSHA officer determines a business' compliance with OSHA requirements and identifies potential job hazards. Any violations or potential hazards an OSHA inspector believes might affect employee safety are recorded and brought to the management's attention. The management is required to correct the situation immediately or within a given time period. If a serious safety violation is identified, the job site may be closed until the problem is corrected. Businesses failing to comply with OSHA's violation notices are subject to civil and criminal penalties. Possible penalties include fines up to $1,000 for failure to correct a violation or prepare reports, up to $10,000 for each intentional or repeated violation, and imprisonment for up to six months for serious violations.

Businesses are also required to comply with worker's compensation laws. Federal and state ***worker's compensation laws*** include plans for worker's compensation insurance to pay employees or their dependents for physical disabilities, injuries, or deaths caused by employment. An employee may sometimes receive insurance benefits even if it is determined that he or she was careless; however, the employee determined to have been careless cannot sue the employer because of injuries. Employees are unable to make claims in certain situations. For example, employees who deliberately injure themselves to collect benefits and employees who are injured while intoxicated cannot file for worker's compensation benefits.

State and local building and safety codes include safety requirements related to fire prevention, structural safety, sizes and number of rooms allowed, exits, ventilation, refrigeration, heating, and sanitary equipment. Codes are enforced during construction, remodeling, use, and operation of a business. Failure to correct safety violations results in fines, loss of certificate of occupancy, and/or jail sentences. ***Certificates of occupancy*** are issued by building inspectors after approval of a building for business use. Code violations also are subject to lawsuits by customers if an injury occurs before the violation is corrected.

Building codes must be followed when buildings are built, rebuilt, or remodeled. The codes ensure the foundation is prepared properly and that it passes a stress test. The planned use for the building must be compatible with the structure in order to meet the building code standards.

Health inspections regularly conducted by the local health department may involve any kitchen or snack area located on the business' premises or the business' compliance with environmental and sanitation standards. The fire department has codes that specify the maximum number of people allowed in public rooms, ratios of fire extinguishers to rooms, types of fire extinguishers required for specific areas, requirements that fire extinguishers are charged regularly before they expire, and operation of fire emergency systems.

In addition to required inspections, managers are responsible for having elevators, boilers, electrical systems, and equipment inspected regularly for maintenance and repairs. If these items are in need of repair, they can be hazardous to the safety of customers and employees.

ENVIRONMENTAL CONCERNS IN AUTOMATED OFFICES

Automated offices present new safety concerns. ***Ergonomics*** is the physiological and psychological study of work. Some companies hire ergonomics experts to identify safety needs. These experts also suggest environmental changes that make workers more comfortable, efficient, and effective. Office automation safety is especially important for employees who use computers in their work. Office automation safety is primarily related to electrical hazards, muscle and skeletal problems resulting from computer use, and conditions affecting the environment.

Some offices have electrical systems that are not adequate to handle the electrical requirements of computer systems. The wiring in older buildings usually should be upgraded if computer systems are added to offices. Electrical cords should be checked periodically to make sure they are in good repair. At the first sign of fraying, an electrical cord should be changed. Keep electrical cords out of traffic paths, if possible. Otherwise, rubber covers should be placed over cords to keep people from tripping and pulling equipment off the work surface.

Offices should be designed with the health and well-being of employees in mind. Eye strain can result from glare on a computer monitor or from having to repeatedly move one's eyes from a document to the computer screen. Headaches, backaches, and overall tension can result if the head must be positioned abnormally to view the monitor or to avoid glare.

Sitting in a restricted position may cause back and neck pain and may restrict blood circulation to the legs. Repetitive movement and improper positioning of the hand and wrist at the keyboard for long periods of time can cause carpal tunnel syndrome. ***Carpal tunnel syndrome*** is a condition involving tendon irritation and swelling of the wrist. Severe cases of this condition can require surgery. To prevent this condition, learn the proper typing position with arms parallel to the slant of the keyboard, fingers curved, and wrists straight.

Office seating should be chosen to fit the bodies of the employees who use it. The backrest for an office chair should extend 14" to 16" above the seat and be 10" to 12" wide. The office chair should also move back and forth, with 4" to 6" of adjustment allowed. The seat of the chair should be 18" to 19" wide, 15" to 17" deep, and adjustable from 16" to 20.5" off the floor. The legs of the chair should have five castors to keep the chair from tipping over when moved. If the employee's feet do not sit flat on the floor, special footrests can be purchased.

If a computer monitor will not tilt, clamps and stands are available that allow the screen to be adjusted. Adjusting the computer screen increases comfort for the operator, makes it easier to use, and reduces glare. Neither natural or artificial light should come from behind the computer operator and fall on the monitor. A non-glare screen makes looking at the monitor for extended periods of time easier on the eyes. If the employee must look at a document while typing, the document should be placed as close to the screen as possible to reduce head movement and eye adjustment. In some cases, eye glasses are needed. Changing tasks periodically helps computer operators reduce eye strain and allows the hands and wrists to rest.

The general work environment in an office is important for safety and health. Air quality in offices is often poor. Chemicals used in office machines, in manufacturing plants, or elsewhere can pollute the air. Passive smoking is also hazardous to health. Passive smoking is the process of inhaling smoke from other people's cigarettes, cigars, or pipes. Therefore, the office ventilation system must work properly and managers should designate smoking areas that are isolated from the work spaces of nonsmokers. The shelf life and hazards information on all stored chemicals should be studied and carefully followed.

Automated equipment in offices such as printers, speaker phones, and copiers has resulted in increased noise levels. It has been found that very noisy offices can cause hypertension and even hearing loss. To reduce noise levels, quieter equipment can be purchased or sound-absorbent enclosures and materials can be used to block the noise. Loud equipment can be located away from workers who do not use it or who perform tasks requiring the most privacy. Workers should be trained in the proper use of office communications systems.

MAJOR CAUSES OF ACCIDENTS

Most accidents are the result of carelessness. Employees should be observant and cautious to prevent accidents while working. The most common accidents are falls, cuts, and burns.

Falls are usually caused by slippery or wet floors, objects in corridors or on stairs, electrical cords in traffic lanes, poor lighting, improper maintenance of floors, brooms and mops in traffic lanes, carelessness, unsteady or broken ladders, and over-reaching. Businesses can be held negligent for some of these causes of accidents such as slippery or wet floors and poor lighting.

People are particularly prone to fall on slick, wet, or greasy tile floors and stairways. Employees should mop up spills and remove greasy substances immediately. Management and employees are also required to make sure areas immediately. Management and employees are also required to make sure areas are well lighted, hand rails are securely in place and properly maintained, and obstructions are removed.

Causes of cuts include use of dull knives; improper use of cutting equipment; broken glass; rough or sharp edges on furniture, equipment, and doors; sharp objects in wastebaskets; improper storage of tools; and falling objects. A sewing machine operator might accidentally stab hands or fingers with a sewing machine needle. All equipment used in the design, production, and care of apparel must be used properly in order to prevent accidents.

Burns, shocks, and explosions result from various situations including improperly grounded electrical equipment, improper handling of electrical cords and appliances, cleaning or repairing electrical equipment connected to an outlet, operating electrical equipment in or near water, handling electrical equipment with wet hands, and cleaning light fixtures or changing light bulbs while electricity is on. Other causes include touching hot surfaces and objects, touching scalding liquids, placing flammable materials near an open flame, wearing loose-fitting garments near a flame, disposing of smoking materials carelessly, using the wrong fire extinguisher, faulty electrical equipment, and careless lighting of gas stoves and heaters.

A number of factors can cause bodily strains and bruises such as lifting objects that are too heavy, improper carrying and lifting, an unsafe work environment, horseplay and practical jokes, and colliding with other people or objects. Fatigue can also be cited as a cause for accidents. ***Fatigue*** is weariness caused by exertion or stress.

Employees are trained to handle equipment in order to obtain the most efficient use of the equipment and to prevent accidents. Frequent accidents and injuries occur when employees do not use equipment properly. For example, an employee not using rubber gloves when working with harsh chemicals is likely to experience an injury.

PROCEDURES FOR ACCIDENT PREVENTION

Most accidents can be prevented. One method of accident prevention is for employees to develop the daily habit of observing work surroundings for potential hazards. Another way to prevent accidents is for all employees to follow safety procedures. Employee efforts toward accident prevention decrease the chance of accidents occurring. Methods of accident prevention are included in table 4.1.

When a safety hazard is discovered, the employee should report it immediately to a department manager or supervisor and the engineering/maintenance department for repair. Potential hazards employees should observe include the following:

- poor lighting in hallways, stairways, walkways, steps, parking lots, and public areas
- exit doors and stairways that are locked or not clearly marked
- lack of directions to exits
- blocked walkways
- slippery or dirty conditions
- overgrown landscaped areas that obstruct walkways and block views
- loose railings and ceiling tiles
- unsanitary conditions
- frayed or worn electrical wires and appliances
- ice or snow on walkways
- poorly maintained or insecure handrails for walkways, steps, and stairways

FIRE EMERGENCY PROCEDURES

Businesses and their employees must always be prepared for the possibility of a fire anywhere in the physical facility or exterior grounds. Every business should assign fire emergency duties and train employees to follow specific procedures in the event of a fire. Should a fire occur, managers and some employees may be assigned the following responsibilities:

- alerting employees of the fire
- directing people to fire exits and safety
- quickly double-checking rooms to be sure all people are evacuated and directed to exits and emergency gathering areas
- pulling out unconscious victims quickly, if possible
- shutting all doors and windows of each room
- reporting to emergency gathering points to be accounted for and for further instructions

Employees should know the locations of fire exits, fire extinguishers, and places to meet when evacuating. In an emergency, employees should stay calm, try to perform their emergency tasks efficiently and quickly, and report to emergency gathering points for roll call. When people panic or become confused, more injuries occur.

Businesses should include fire-related procedures in each employee's training and continue to reinforce training with drills. Regular fire drills prepare employees for emergencies. It is an employee's responsibility to know correct procedures if a fire emergency occurs. Several employees of each business should be trained to operate fire extinguishers and alarms and to perform ***cardiopulmonary resuscitation (CPR).*** CPR is a lifesaving method involving artificial respiration while attempting to restart the victim's heartbeat.

Fire emergency systems in buildings should be inspected regularly. These systems include smoke and heat detectors, fire alarms, sprinkler systems, fire hoses, fire dumps, and fire extinguishers. Fire exits should also be clearly marked, visible, unobstructed, and unlocked. Fire equipment sites should be clearly marked, visible, and unobstructed.

Engineering/maintenance departments serve as technical advisors during a fire. They are responsible for helping firefighters by providing information about the building structure and electrical systems. Firefighters need information on how electrical systems are connected and wired and where fire hoses, water hydrants, and electrical panels are located. Firefighters also need access to chaseways and all rooms. Engineering/maintenance staff have knowledge of all electrical, heating, air conditioning, and plumbing systems within the building.

Certain employees may be responsible for removing cash, business records, invoices, and inventory lists and photographs from the premises when evacuating for a fire or any other emergency. Business records may include checkbooks, payroll records, bookkeeping ledgers, and journals. These items should be kept in one fire-proof place, if possible, for easy removal during an emergency.

Employees should reach emergency gathering points quickly so that they can be accounted for by managers. Employees may receive additional emergency-related duties when they reach these gathering points. Department managers should know exactly which employees are on duty in order to accurately account for all employees.

Fires may be reported by breaking the glass over fire alarm boxes and pulling the alarm or by calling the fire department and front office by telephone. Employees should know the location of all fire alarm boxes. The fire department also may be reached by calling the operator or the 911 service.

Emergency telephone numbers should be posted near all telephones and on the inside cover of telephone directories. When reporting a fire, provide the following information:

- the name of the person reporting the fire
- the business' name
- the address of the business
- the type of fire
- the size of the fire

Accident Prevention

Burns

- Wear close-fitting clothing when working around heating elements or open flames.
- Use thick, dry hot pads or mitts when handling hot containers.
- Keep flammable materials (such as fabrics, oils, and aerosol products) away from open flames.
- Get help to handle hot, heavy containers.
- Avoid overflowing containers with hot liquids.
- Do not reach into oven; pull out oven rack and then remove container.
- Follow safety procedures when operating and caring for equipment that has parts which are hot.

Fires

- Inspect fire systems two times a year. (Fire systems include smoke and heat detectors, fire alarms, fire extinguishers, fire hoses, fire panels, and sprinkler systems.)
- Keep fire extinguishers near cooking, trash, and electrical areas.
- Do not leave electrical heating appliances, such as irons, unattended.
- Do not allow unattended electrical heating appliances to touch nearby items when hot. Nearby items may burn, melt, or result in a fire.
- Make sure burned out matches are not smoldering (burning or smoking without a flame) when thrown into trash cans.
- Extinguish smoldering items by smothering and wetting them with water.
- Never use water or flour to extinguish a grease fire.
- Never try to carry a pan with burning contents to another location.
- Store combustibles away from heat sources and in metal containers. Combustibles are materials that catch fire easily.

Figure 4.1

Gas Explosions

- Check to see that the pilot light is on before lighting a range, water heater, dryer, or other gas appliance.
- Turn on the exhaust fan before lighting a gas range or any other gas appliance.
- Strike the match before turning on the gas to light an appliance.
- Check to see if the pilot light is on if there is a smell of gas upon entering a room with a gas appliance.
- Open windows and report a possible leak to the gas company if pilot lights are on and there is still a smell of gas.
- Do not light matches, turn on electrical equipment or lights, or cause any spark or flame until the source of a gas odor has been determined and corrected.

Electrical Shock

- Be sure electrical cords are in good repair.
- Never pull on an electrical cord when disconnecting from wall outlet; grasp the plug.
- Unplug electrical equipment from the wall outlet first, then disconnect the cord from the equipment.
- Never handle electrical equipment while hands are wet or while standing in water.
- Wear rubber-soled leather shoes to prevent electrical shocks and to prevent burns from hot spills.
- Make sure an appliance is turned off before it is plugged into an electrical outlet.
- Unplug electrical equipment before cleaning it.
- Report any faulty electrical equipment or outlets promptly.
- Do not use aluminum ladders around electrical sources.

Back Strain

- Lift heavy objects by squatting to the level of the object with feet apart and knees bent. Move objects close to the body and raise up by straightening the knees gradually and keeping the back straight. Do not bend over to lift objects.
- Set objects down by reversing the lifting procedure. Keep the back straight and the object close to the body. Keeping feet apart and legs straight, begin lowering the object gradually by bending the knees slowly.
- Do not overload trays, carts, or arms.
- Balance the weight on trays carefully.
- Get help to lift and carry heavy objects.
- Store heavy items on lower shelves.

Figure 4.1 - Continued

Falls

- Keep floors clean, dry, and free from obstructions.
- Clean up spills or slippery areas from floors immediately.
- Walk, instead of run, through corridors.
- Wear low-heeled, closed-toed, comfortable work shoes with rubber soles.
- Keep work areas and walkways clear and neat.
- Use a sturdy stepladder for reaching objects on high levels; never use a chair.
- Avoid overreaching.
- Watch path and be aware of upcoming changes or obstacles in pathway, especially around corners and through doors.

Fatigue

- Get plenty of rest each night.
- Eat a nutritious diet.
- Practice good posture.
- Take rest breaks.
- Use time and energy-saving work methods.
- Become organized.
- Develop and maintain a positive attitude toward work and life.
- Develop good relationships with co-workers.
- Leave personal problems at home.

Cuts

- Discard chipped or cracked glasses and dishes.
- Sweep up broken glass immediately.
- Pick up glass splinters with a damp paper towel and discard.
- Do not pick up broken pieces of glass with hands.
- Put broken glass in a separate trash container or wrap in newspaper before placing in trash container.
- Discard open cans and their lids promptly.
- Smooth sharp edges with a file.
- Position the fingers away from the needle when operating a sewing machine.
- Avoid knife cuts as follows:
  - Keep knives sharp. Store them in a knife rack or in slots in a drawer.
  - Use the proper knife for the job.
  - Pick up a knife by the handle and always carry a knife with the point down and cutting edge away from the body.
  - Make cutting motions away from the body and away from other workers.
  - Curl the fingers like a claw to keep them away from the knife's blade when holding an object that will be cut.
  - Store knives properly. Do not leave knives where they cannot be seen or where they do not belong.
  - Quickly move out of the way if a knife falls; do not try to catch it.

Figure 4.1 - Continued

Unless a fire is small and the employee is trained to use fire extinguishers, an employee should never try to extinguish a fire alone. Help should be obtained by a supervisor. Getting help provides more people to assist and warns other employees of the fire. Small fires can become uncontrollable, large fires quickly.

A ***fire extinguisher*** is a portable container filled with chemicals and water for use in putting out small fires. Most extinguishers are labeled with letters and pictures to indicate the type(s) of fire for which each extinguisher should be used. Some fire extinguishers also have a number rating on the label to indicate the amount of fire it can extinguish. Ratings range from 1 to 240.

Fires are classified into the following three categories:

- ***class A fire*** – wood, paper, rubbish
- ***class B fire*** – gas, grease, paint, lacquer, other liquids
- ***class C fire*** – live electrical equipment

Using an extinguisher on a type of fire for which it was not intended may make the fire worse. For example, using a water extinguisher (designed for class A fires) on a class B grease fire or a class C electrical fire would be hazardous. Some fire extinguishers are made using multipurpose chemicals and are labeled Class ABC. These extinguishers will put out most types of fires.

If a small fire develops, a trained employee should take a charged extinguisher to the fire immediately. To use a fire extinguisher, the pin should be pulled out first. If the extinguisher has a hose, the hose is held in one hand and pointed at the bottom of the blaze. If the extinguisher does not have a hose, the top of the extinguisher is pointed at the base of the fire. The handle is squeezed to spray the contents of the extinguisher on the fire. Starting at the fire's base, the fire is sprayed with a sweeping motion until the fire is out or is too large to handle. One should walk slowly toward the fire while spraying. If the fire is in a trash can, the extinguisher should not be pointed straight down into the can. Instead, the extinguisher is pointed at an angle to prevent chemicals from splashing. Fire extinguishers must be recharged immediately after their use.

If possible, fires should be contained in one area by closing all doors and windows around the fire. This procedure keeps a fire from spreading quickly. A fire needs a supply of oxygen, fuel, and heat in order to burn. To put a fire out, one of those ingredients must be eliminated. By shutting doors and windows, the oxygen supply is almost eliminated. It can be further eliminated, if time allows, by sealing the bottom of doors with wet towels. However, it is usually not possible to follow this procedure when an employee is trying to evacuate a business full of people. Other methods of eliminating oxygen include the following:

- Use a fire extinguisher.
- Smother the fire with a fire blanket.
- Drown the fire with water.
- Douse the fire with baking soda.

Drowning a fire with water does not work for all fires. Water should not be used to extinguish grease, oil, or electrical fires. Addition of water can cause an electrical fire to spread and can result in electrocution or shock. Water can be used to extinguish paper, wood, cloth, and ashtray fires.

To remove fuel from a fire, nearby flammable materials should be removed. For an electrical fire, the electrical power should be switched off at the breaker switch to remove fuel. Gas valves should also be turned off to remove fuel from a fire.

When trying to extinguish a fire, an escape route should be left open in case the fire increases in size. Reaching over a fire to get an extinguisher or water is dangerous and can result in bodily burns or clothing catching on fire.

MEDICAL EMERGENCY PROCEDURES

Employers are responsible for training employees to handle medical emergency situations. Each employee should pay careful attention to training related to handling medical emergencies. Several employees of every business should be trained in CPR lifesaving skills and the Heimlich maneuver that is performed on choking victims.

While an employee trained in lifesaving techniques cares for the victim, another employee should call for emergency medical service. At the scene, the trained employee should assess the situation and begin necessary emergency procedures until paramedics arrive.

While waiting for medical help, the employee assisting an injured victim should do the following:

- Assure the victim that help will arrive soon.
- Remain calm.
- Keep the victim calm.
- Keep other people away from the emergency scene.
- Make sure medical help is on the way.
- Remain with the victim until medical help arrives.
- Find out what happened to the victim.
- Report potential hazards to management for correction.
- Give details of the situation to medical personnel and general manager.

An employee assisting with an emergency should not discuss who is at fault in the situation, insurance coverage, or medical payments with the victim. These types of actions can result in a variety of problems. After an emergency, the management investigates to find the cause of the accident, injury, or illness and how to correct any problems. It is important to prevent future problems of similar nature.

When paramedics arrive at an emergency scene, they assess the situation and determine if the victim should be transported to a hospital for further emergency treatment. The victim may be transported by ambulance, rescue vehicle, or airlift. If the victim is taken to a hospital, his or her belongings may be left behind at the business. The victim's belongings should be stored in a safe place until instructions are received from the victim or the victim's family.

Severe Blood Loss

Severe bleeding must be stopped immediately. A doctor or emergency medical team should be called when an individual is bleeding severely. Shock and loss of consciousness may occur during severe bleeding. First aid for severe bleeding is to apply direct pressure firmly to the wound with a clean dressing held in place by the hand. This method prevents blood loss without interfering with normal blood circulation.

The best dressing to use for severe blood loss is a thick pad of sterile gauze, a sanitary napkin, or a folded clean cloth. If these items are not available, the cleanest, absorbent material available should be used. Absorbent cotton matting should be avoided because loose fibers will remain in the wound. The purpose of the dressing is to absorb the blood and permit blood clotting. If necessary, pressure may be applied with the bare hands until a dressing is obtained. Once the dressing is in place, it should not be removed until the bleeding stops. More dressings may be needed on top of the original one to absorb the blood before it begins to clot.

If possible, the injured area of the body should be raised above the level of the victim's heart in order to slow the blood flow to the wound. If bleeding continues, direct pressure should be applied to the wound. Pressure may be applied at ***pressure points*** as follows:

- scalp – Press a thumb against the bone just in front of the victim's ear.
- face – Press fingers against the hollow spot in the victim's jaw.
- neck – Place the thumb against the back of the victim's neck. Place the fingers on the side of the neck just before (not over) the windpipe and press toward the thumb.
- chest or armpit – Press the thumb in the groove behind the victim's collarbone.
- arm – Place the fingers on the inner side of the victim's arm, pressing in the groove between the muscles. Keeping the thumb on the outside of the arm, press toward the bone.
- leg – Place the heel of the hand on the inner thigh at the crease of the victim's groin. Press against the bone.

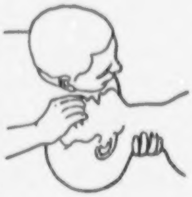
Before using the described methods to treat severe blood loss, employees should complete first-aid training to understand correct procedures to use. A ***tourniquet*** is a device used to stop bleeding such as a bandage twisted around an arm or a leg. A tourniquet should only be used in cases of massive bleeding (such as with a severed limb) which cannot be controlled using other methods. The decision to apply a tourniquet is a decision to risk loss of an arm or leg in order to save the victim's life. In all cases of severe bleeding, a doctor's care is needed immediately.

Maintaining Breathing

Immediate action is required if a person stops breathing. Permanent brain damage or death can result if breathing does not begin four to six minutes after the heartbeat has stopped. A person's breathing can stop for any of the following reasons:

- obstruction in the air passage
- swelling due to damage of the air passage following the swallowing of a corrosive substance (such as lye)
- acute asthma attack
- lack of oxygen in the air (as in gas poisoning or being locked in an enclosed space)
- suffocation due to a plastic bag or other materials blocking the mouth and nostrils
- electrical shock
- poisoning
- drowning

A person who has stopped breathing may be unconscious with no breathing movements of the chest or stomach. The person's lips are likely to be blue and the pupils will be dilated. To properly restore a person's breathing, employees should be trained in the use of CPR.



First aid to restore a person's breathing includes the following steps:

- Begin first aid immediately. Direct someone else to call for a doctor or ambulance while first aid is being used.
- Check for blockage of the air passage. Use first-aid methods appropriate for the age of the victim. These methods may include back blows and abdominal thrusts.
- Apply a method of artificial respiration that is appropriate for the age of the victim (mouth to mouth or mouth to mouth/nose respiration).
- Continue artificial respiration, including during transportation to the emergency room, until breathing begins or until the victim is in the care of medical personnel.
- Treat the victim for shock.
- Get medical care, even if breathing is restored.

Choking

Choking can happen easily and can be life threatening. It occurs when something such as food becomes lodged in a person's throat and cuts off breathing. The person is unable to speak and may be unable to move or alert anyone to the problem. Without help, a choking person can die in a few minutes.

It is important to become aware of signs that a person might be choking. A choking person must be assisted quickly and immediately. To determine whether a person is choking or having a heart attack, one should ask the person if he or she needs help. If the person is unable to answer aloud, he or she is choking. The heart attack victim can speak. Also, a choking victim is unable to cough or breathe, and may turn blue in the face or use a distress signal (such as grasping the throat).

If the person is choking, someone should act at once to dislodge the obstruction by using the Heimlich maneuver, also known as the ***abdominal thrust***. The ***Heimlich maneuver*** involves use of the following procedures:

- Deliver four sharp blows rapidly between the victim's shoulder blades with the heel of the hand.
- Direct a series of manual thrusts to the victim's upper abdomen or chest to force air from the lungs.

The abdominal thrust procedure varies with the victim's position. If the victim is standing or sitting, the rescuer should stand behind the victim and wrap his or her arms around the victim's waist. The rescuer should place the thumb side of his or her fist against the victim's abdomen, palm side down, and exert a quick upward thrust.

When the victim is lying down, the rescuer should place the victim on his or her back and kneel beside or astride the victim. The heel of one hand should be placed in the middle of the victim's abdomen, slightly above the navel and below the rib cage. The other hand should be placed directly above the first. The rescuer then should rock forward so that his or her shoulders are directly over the victim's abdomen and press toward the diaphragm with a quick upward thrust. The rescuer should not press to either side. The thrust should be repeated up to four times, if necessary.

The chest thrust is an alternative method to the abdominal thrust and is used on obese victims, children, or women in the last few months of pregnancy. The rescuer applies pressure from 1" to 1 1/2" (about the width of three fingers) above the lower tip of the breastbone. The lower end of the breastbone should never be pushed directly.

If the victim is a child, the rescuer should place the child on his or her back and proceed as recommended for an adult victim lying down. However, the rescuer should kneel next to the child and use the heel of one hand to perform the abdominal thrust. If the victim is an infant, the rescuer should not apply any measures if the infant can breathe, make sounds, or cough. These signs show that the infant's windpipe is partially obstructed and that the infant is getting air into the windpipe, which can help expel the object. Trying to remove the obstruction may make the situation worse by totally blocking the windpipe. The infant should be watched closely and continuously.

If the infant is unable to make sounds or breathe, the rescuer can use the following procedures:

- Place the infant face down over rescuer's forearm with the infant's head lower than its body.
- Use the heel of the rescuer's hand to give four back blows between the shoulder blades. These blows should be forceful but measured.

- If back blows do not dislodge the obstruction, turn the infant on its back on rescuer's thighs with the infant's head lower than its body.
- Apply four rapid chest thrusts by using the index and middle fingers of one hand. Place the fingers on the center of the infant's chest just below the level of its nipples and press the chest four times rapidly.
- Open the infant's airway by holding the tongue and lower jaw between the thumb and finger and lift if chest thrusts are unsuccessful.
- Look for the obstruction in the infant's throat, and attempt to remove the obstruction only if it is plainly visible.
- Administer two breaths through the mouth or through the mouth and nose (as in artificial respiration) if the infant is not breathing. Check to see if the infant's chest rises.
- Repeat the back blows and chest thrusts if the infant's chest does not rise, and have someone call for medical help and an ambulance.

Shock

Shock is a serious condition that follows injury or sudden illness and can be fatal. Shock results from a depression of vital body functions. It is a sign that the body is over stressed. In all cases of shock, the blood flow to vital organs is reduced and a person will probably not be able to breathe well. Every victim of injury or illness should be treated for shock, even if symptoms of shock do not appear. The symptoms of shock are as follows:

- pale or bluish skin
- cold, moist skin
- weak, rapid pulse
- shallow or deep breathing
- weakness, dizziness, anxiousness, or restlessness

First aid for the treatment and prevention of shock includes the following steps:

- Keep the person lying flat on the back. In case of nausea or unconsciousness, turn the head to one side. Raise the feet eight to twelve inches unless doing so might further harm an injury. If the person has trouble breathing, slightly raise the head and shoulders unless other injuries might make this action unwise.
- Place a blanket over the person to prevent chilling. The blanket should retain body heat but not add to it. Do not apply a heating pad, a hot water bottle, an electric blanket, or any other heating device.
- If the person is thirsty, moisten the lips. Do not give fluids if the person is unconscious, is nauseated, has head or abdominal injuries, may require surgery, or if medical help will arrive in less than one hour.
- Get medical help as soon as possible.

Burns

Burns are classified into the following three degree types:

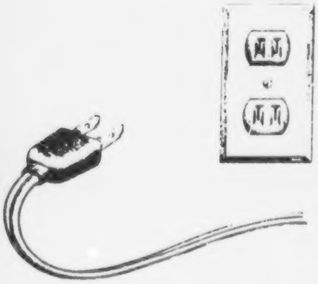
- ***first degree burn*** – Skin is reddened but unbroken and should be treated by placing under cold water.
- ***second degree burn*** – Skin is reddened and blisters form. Skin should be treated by placing under cold water and then covered with dry, sterile dressing.
- ***third degree burn*** – Skin is partly destroyed and charring is present. Skin should be treated by covering entire area with a dry, sterile dressing.

Severe burns may result from fire, electrical shock, scalding liquids, or touching hot objects. Not all burns require medical treatment. However, third degree burns must be cared for by a doctor.

If a burn is severe, the burned area should not be chilled or submerged in cold water. These are appropriate techniques to use for minor burns. Using these treatments for severe burns may cause shock. Severe burns should be covered with loose, dry, sterile dressing to help prevent infection. The burned area should not be touched. Ointments or antiseptics should not be applied to the burned area. The burn victim should be treated for shock and taken to a hospital emergency room for treatment immediately.

If a person's clothes are on fire, the person should be stopped from running. The person should be rolled in a blanket, in a coat, or on the ground to put out the flames. Clothing that is attached to burned skin should not be removed.

In job situations where acids or caustics are used, employees should take care to prevent skin coming into contact with these substances and experiencing chemical burns. If a chemical is spilled on a person's skin, the affected area is placed under flowing, fresh, clean water to flush the substance from the surface. If a chemical gets in or near a person's eyes, the eyes should be rinsed immediately with running water for several minutes. Each eye should be flushed in the direction toward the ear, away from the nose. This method keeps the chemical in one eye from being flushed toward the other eye. The eyes should be bandaged after flushing. According to OSHA regulations, employees who work with caustics and acids should have protective occupational safety equipment to protect skin from contact with these substances.



Contact with an electrical current may cause a burn or unconsciousness. It can also cause breathing or the heartbeat to stop and may result in death. To rescue a person from electrical shock, the contact between the person and the source of shock must be broken without allowing anyone to touch the person. Any person who touches the person being shocked will also receive the electrical shock. If the accident involves an electrical cord, the first step is to unplug the cord. If this is not possible, the master switch inside the electrical control box for the building should be turned off. If neither of these procedures is possible, a material should be used that does not conduct electricity (such as a broom, a wooden board, rubber, cloth, or a rope) to move the person away from the source of the electrical current.

When the person is free of the electrical current, appropriate first aid should be used immediately. If breathing has stopped, artificial respiration should be given at once. If the heartbeat also has stopped, CPR is used. The victim should be treated for burns and shock. Medical care should be obtained immediately.

Head, Neck, and Back Injuries

Head injuries may show no immediate symptoms except a bump and bruises. However, head injuries may cause bleeding inside the skull. Brain damage and even death can result from such an injury. Symptoms that may occur later include headache, dizziness, drowsiness, blurred vision, vomiting, and unconsciousness.

If a neck or back injury is suspected, the person should not be moved unless there is danger of explosion, fire, or other life-threatening circumstances. If the person must be moved for these reasons, he or she should be moved with caution and first-aid procedures should be followed. The victim should be treated for shock and other injuries. The person should be moved to a hospital immediately by emergency medical personnel.

In the case of head, neck, or back injuries, the person should always be immobilized. To ***immobilize*** means to hold or position so that a part of the body cannot move. The head is immobilized in the position found by placing rolled up clothing or blankets around the head and the sides of the neck and shoulders. For back injuries, the torso is also immobilized. First-aid training helps employees understand different methods to use for different types of head injuries.

Points to Remember

- Each business should establish a safety program, purchase liability insurance, and purchase worker's compensation insurance for protection against accidents and injuries.
- Businesses can prepare employees to handle emergencies by enforcing safety rules and planning occasional emergency drills.
- Employees should report safety hazards immediately.
- Businesses are responsible for keeping and maintaining first-aid supplies. Employees should participate in first-aid training.
- Government regulations, codes, and standards exist to help businesses eliminate safety hazards and prevent accidents. OSHA encourages all businesses to establish safety programs and to keep records on all employment related accidents.
- OSHA compliance officers periodically inspect job sites and businesses to make sure work environments are safe. The officers determine businesses' compliance with OSHA requirements and any potential job hazards. Some businesses also sponsor employee safety committees that are responsible for checking various departments regularly to spot hazardous conditions and unsafe work habits.
- As more offices have become automated, new safety concerns have resulted. Electrical systems, muscle and skeletal problems resulting from computer use, and conditions affecting the environment are concerns in automated offices.
- Most accidents result from carelessness. The most common accidents are falls, cuts, and burns.
- Most accidents can be prevented by observing potential safety hazards and following safety procedures.
- To prepare for fire emergencies, businesses should assign specific emergency responsibilities to employees, train employees to operate fire extinguishers and alarms, train employees to perform CPR, and inspect fire emergency systems regularly.
- If a medical emergency occurs, employees are responsible for getting a trained individual to handle the situation as soon as possible. Businesses often train some employees to perform CPR and the Heimlich Maneuver in case emergency action is needed until professional help arrives.

Words to Know

abdominal thrust
cardiopulmonary resuscitation (CPR)
carpal tunnel syndrome
certificates of occupancy
class A fire
class B fire
class C fire
ergonomics
fatigue
fire extinguishers
first aid
first degree burn
Heimlich maneuver
immobilize
liability
negligence
Occupational Safety and Health Act of 1970
Occupational Safety and Health Administration (OSHA)
pressure points
second degree burn
third degree burn
tourniquet
worker's compensation laws

Questions for Review

1. What does liability involve?
2. What can employees do to increase safety while at work?
3. What should businesses do to increase safety in the workplace?
4. What are examples of items that should be kept in a first-aid kit maintained by a business?
5. What are three examples of OSHA safety standards that apply specifically to the textiles and apparel industries?
6. What are some of the environmental concerns resulting from the automation of offices?
7. What are the most common accidents? What are some of the most common causes of accidents?
8. What information should be given to the fire department when reporting a fire?
9. On what basis should a fire extinguisher be selected for use in extinguishing a small fire?
10. What should an employee do to assist an injured person while waiting for medical help?
11. What should be done to assist a choking person?
12. What procedures should be used to treat severe blood loss?
13. What procedures should be used to treat and prevent shock?

5

Goals, Policies, and Procedures

ESSENTIAL ELEMENT

- Apply organizational goals, policies, and procedures.(q1E)

OBJECTIVES TO ACHIEVE

- Describe how goals, policies, and procedures influence business structures.
- Explain the importance of understanding the organizational structure of a business.
- Review how ethics, employee orientation, probation periods, attendance, performance appraisals, disciplinary action, dismissal, and resignation relate to organizational policies.
- Relate vacations and sick leave, uniforms and dress codes, use of time clocks, identification badges, work-related injuries, complaints and grievances, and labor unions to organizational policies.
- Discuss organizational procedures that influence the structure of a business.
- Outline how work schedules are used to manage employee work assignments.
- Describe methods used to compensate employees.

Each business has specific goals, policies, and procedures. A ***goal*** is something a person or organization works to attain. A ***policy*** is an overall plan that states the goals and operating procedures of an organization. Policies are made to ensure the smooth operation of the business. Policies also enhance the relationships between employees and management and between staff members and the customers they serve. ***Procedures*** are step-by-step guidelines that help employees perform jobs efficiently with the same results each time. Procedural guidelines allow supervisors to fairly evaluate an employee's job performance.

ORGANIZATIONAL GOALS

It is important for employees to understand how businesses are structured. A business may have a very simple or a very complex structure. Most businesses have written goals and objectives. The underlying or main goal of a business is usually referred to as a mission statement. A ***mission statement*** is a broad statement that explains the purpose or direction of the company. All plans for the business are based on the broad mission statement. More specific goals are identified after the mission statement is written. Policies and procedures are selected that help the business achieve the identified goals.

A company's mission statement and other goals may be changed as conditions change or as the business grows. A company's mission statement should be developed by considering the following five elements:
- the company's history
- current preferences of the management and owners
- environmental factors
- available resources
- competencies and abilities of the company

Most successful companies develop a mission statement and other goals by focusing on the customer rather than on the goods or services produced by the company. Products and services change while customer needs last.

ORGANIZATIONAL POLICIES

Each business sets its own policies based on the philosophy of the owner/management, type of business, mission statement, and other factors. All organizations have a chain of command or hierarchy. A ***chain of command*** or ***hierarchy*** is a structure of ranks within an organization according to the amount of authority each possesses. An ***organizational chart*** illustrates the chain of command for a company. Figure 5.1 is an example of an organizational chart for an apparel retail business. The organizational chart helps employees understand how the organization should function. An organizational chart also helps employees see how departments are related to each other. The chart illustrates the proper channels for transferring information, initiating complaints, and submitting reports. It shows the lines of authority and allows employees to understand the possibilities of advancing in the organization.

The expected order of conducting communications between departments is often referred to as ***company protocol*** or using the ***proper channels***. In large businesses, the chain of command may be provided in written form to employees. In smaller organizations, the chain of command may not be written. In this situation, employees must become familiar with the chain of command for the company over a period of time. It is important for new employees to listen carefully and ask appropriate questions in order to understand the operating structure of a business.

Management is the executive level of an organization where decisions are made and policies are set. At the ***mid-management level*** or ***supervisory level***, policies are interpreted and procedures are outlined. At the ***staff level***, procedures are carried out. Each level is responsible to the next level and is dependent upon the next level to be able to function effectively.

Each employee is accountable to a supervisor. ***Accountability*** involves answering to someone for work done. The success of a company depends on employees, supervisors, and employers sharing responsibilities fairly. Supervision is an essential part of seeing that all parts of the business are fulfilling assigned responsibilities.

Various job titles are given to persons employed in the textiles and apparel industries. As noted previously, each business may assign different job titles to people who perform essentially the same tasks. Job titles in the textiles and apparel industries change over time just as job titles change in other industries. Becoming familiar with assigned responsibilities and the organizational structure of a business helps one understand what job titles mean.

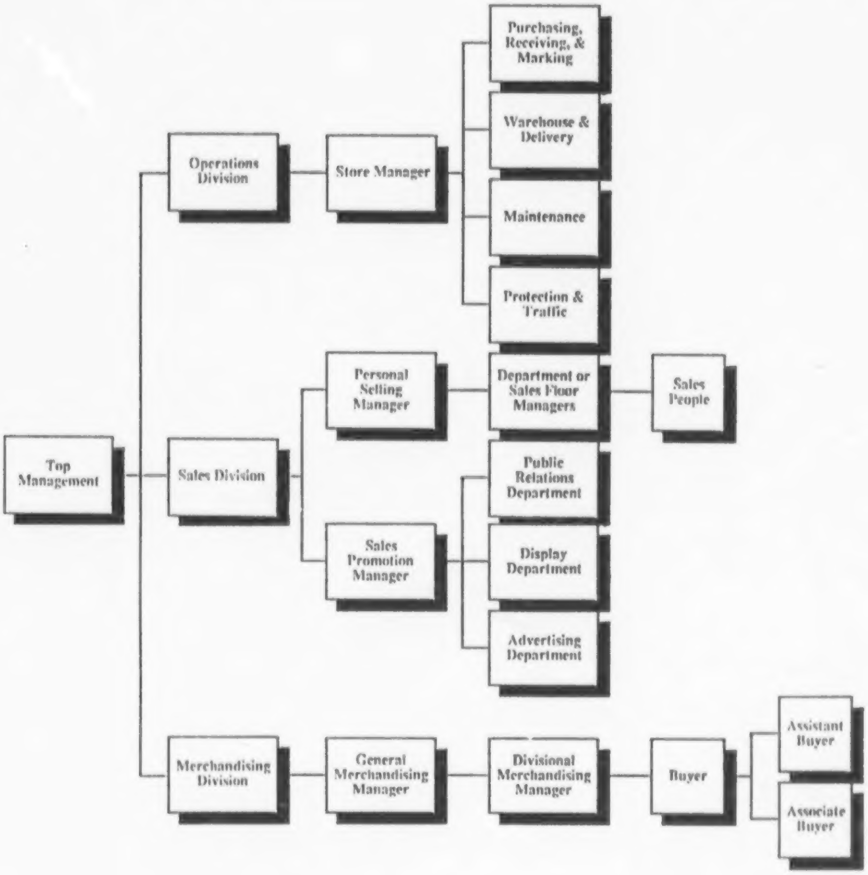


Figure 5.1

Ethics

Ethics are the principles and standards of conduct that govern a profession, business, or group of people. Many professional groups or businesses have a written set of standards called a ***code of ethics***. As a member of the group, a person is asked to follow the standards of the organization. ***Ethical behavior*** is the personal behavior of a member of that group who follows the standards to which the group subscribes.

Employees in the textiles and apparel industries are engaged in a variety of tasks that require ethical behavior. In any job, there are many opportunities for an employee to choose between ethical and unethical behavior. For example, salespeople are often responsible for large sums of money. Handling the employer's money in a responsible manner and ensuring that the standards of the business are followed shows ethical behavior. When a company sets and enforces policies, employees find it easier to make ethical decisions.

Honesty, moral integrity, and reliability are traits that employers and customers expect from employees. The personal actions of employees affect the reputation of the business and its relationship with customers. In addition, each employee's personal actions affect relationships with co-workers. Management should serve as a role model for employees in providing an example of ethical behavior. If a supervisor is involved in unethical business practices, he or she sends a message to employees that unethical behavior is acceptable or will be overlooked. By setting positive ethical examples, by carefully screening employees for ethical practices, and by taking prompt action when unethical behavior occurs, management can develop a strong ethical team.

Employee Orientation

Orientation is a process used to help new employees become familiar with a business. During orientation, an overall summary of the business is presented. Company officials may meet with each group of new employees to welcome them and to explain certain policies. Sometimes, a tour of the facilities is conducted. A company's orientation process may last from a few hours to several days, depending on company policies.

The ***policy manual*** or ***employee handbook*** is a book that outlines company rules and lists information regarding insurance, sick leave, vacation, and other benefits. This information is usually explained to new employees during orientation. A copy of the book is usually provided to each new employee.

Probation Periods

A probation period is a period of time during the beginning of employment when the new employee is trained to meet the standards set for his or her job. An employee who meets the standards by a set period of time, usually thirty to ninety days, is allowed to continue employment. The probation period allows for both the employer and employee to evaluate each other and the job situation. The supervisor determines if the employee shows initiative, accepts responsibility, performs the job as required, and gets along well with others. The employee determines if he or she likes doing the type of work assigned, can meet the production schedule, is being paid adequately for the work required, has opportunity to learn new skills, and/or can advance to other positions.

Attendance

Good attendance is an important job requirement in any organization. Every employee is expected to report for work regularly and on time. Failure to come to work and chronic tardiness is unfair to other employees who must adjust work assignments to see that the absent or tardy employee's work is done. Such situations result in resentment among employees and slows down work production. Promotions and future employment recommendations are affected by attendance and punctuality.

If an employee must be late to work or cannot attend because of illness or an emergency, he or she should call a supervisor as soon as possible. This helps supervisors arrange for replacements and adjustments to be made and avoids various problems. Employee handbooks usually identify who should be called prior to necessary absence or lateness and what procedures are to be followed when the employee returns to work. Most companies require that forms be completed to record an absence and/or to apply for sick leave or vacation leave. Some companies require that an employee who is absent because of illness submit a written excuse from a doctor that verifies the illness. Absenteeism or continual tardiness is a serious concern of management and may result in disciplinary action.

Performance Appraisals

A ***performance appraisal*** is a process used to evaluate an employee. A supervisor uses a performance appraisal instrument or checklist to do the employee evaluation. Performance appraisals are performed by supervisors at certain times throughout employment including the probation period. Evaluations allow the employee and the supervisor to evaluate performance and to set new goals. Employees should view appraisals as an important step in achieving new goals and working toward advancement.

Evaluations are management tools used to ensure that productivity is kept at a high level. The items evaluated usually relate to the policies and procedures of the company and employee characteristics such as initiative, leadership, cooperativeness, attitude, reliability, punctuality, personal habits, and dress. Each item on the appraisal should be clearly explained to the employee.

At a performance appraisal interview, the supervisor and employee should review the employee's job description. A ***job description*** is a written summary of a specific position including the major responsibilities of the job and the experience and/or education necessary for the position. A job description may also include items such as any unique aspects of the position and the reporting process and the place of the position in the overall structure of the organization.

Some companies maintain an incident file for each employee. An ***incident file*** is used to collect information that establishes and verifies the employee's job performance. Each item placed in the file should be discussed with the employee. An employee's incident file should be kept confidential and should be available for the employee to view at his or her request. Often incident files are used by supervisors in completing employees' performance appraisals.

Disciplinary Action

An employee's failure to observe company rules can result in disciplinary action. Such action can involve a private discussion with the supervisor, a written notice of misconduct, a suspension or probationary period, or a termination. The disciplinary action process involves a series of steps. The first step is usually a verbal warning which may be given by the supervisor in the employee's work area or in the supervisor's office. This informal talk is used to establish an understanding of the supervisor's expectations.

If an employee fails to perform work or displays conduct that is not appropriate for the standards of the business, the next step may be to hold a conference with the employee. The conference helps determine if the employee understands the rules involved or the standards of work expected. The employee may be asked to sign a record stating that he or she understands what is expected and has been advised of the next step if improvement does not occur.

If the employee's performance or behavior does not improve, a written notice of disciplinary action may be prepared. A written notice may be presented to the employee in the supervisor's office. The letter to the employee details how performance or conduct has failed to meet the company's standards. The letter also states how work performance can be changed to meet acceptable standards. The employee is asked to read the dated notice and to sign it. Signing the notice means that the employee has received and understands the notice. A written notice of disciplinary action is placed in the employee's file after the conference is held.

The next infraction of a rule by an employee or refusal of the employee to correct his or her actions may lead to immediate dismissal, suspension from work without pay, or a probationary period. Being dismissed or fired not only results in economic consequences for the employee, but may also make it difficult for the employee to secure another job.

Unless a work situation is life-threatening, could lead to injury, or is immoral, the employee has the responsibility to follow polices of the business. Any disagreements with the company policies and rules should be discussed with a supervisor. If an employee feels that he or she cannot follow the company's rules, it is better to resign than to be dismissed.

Dismissal

Dismissal or ***termination*** is removal of an employee from a job because of misconduct, insubordination, poor work performance, or other good cause. Dismissal may follow the disciplinary process because of the employee's failure to correct poor work performance or misconduct. ***Misconduct*** may be a reason for immediate dismissal without the usual review process. The following examples of misconduct might result in immediate dismissal:

- unauthorized use of records or identification material
- theft or misuse of company property
- intentional furnishing of false information (such as on a job application)
- use of force or violence
- physical abuse of any person on company property
- unauthorized entry or use of facilities
- use, possession, or distribution of drugs, alcoholic beverages, or any substance that is regulated by federal or state law
- indecent or obscene conduct on company property or at a sponsored or supervised function
- failure to comply with the lawful direction of the management where such directions are issued in the performance of job duties
- engaging in a second business or profession during company working hours
- disclosing confidential information acquired by reason of the position

Sometimes, companies must terminate employment for some individuals because of lack of funding or lack of work. When such situations occur, the terminations may be referred to as laying off employees. Most businesses try to move productive employees into other positions rather than terminate employment when such problems occur.

Resignation

Resignation is the voluntary relinquishing of a position by an employee. Resignation from a job involves following certain procedures. A company may have a form that an employee completes to notify the employer of resignation. In most cases, the employer will accept a written letter from the employee notifying of plans to resign. Small businesses may accept a verbal resignation.

An employee may resign for a variety of reasons. The employee may move to another location, have an opportunity for another job, be unhappy with the present job, or may return to school. How long an employee must work following the notice of resignation depends on the company's policies. A general guideline is that an employee should expect to work at least one pay period following the notice. Therefore, the employee would work one week if paid weekly, two weeks if paid semimonthly, or one month if paid monthly. Various circumstances may require that other arrangements be made. For example, if a person learns that his or her family must move in two weeks, there may be no choice about how long the person can work after resignation. The employee should discuss the situation with the supervisor. An employer is more likely to provide good references if an employee shows responsible behavior by following proper procedures when resigning from a job.

Vacations and Sick Leave

Most businesses offer employees benefits such as specific amounts of time for use as sick leave and vacation leave. ***Vacation leave***, or ***annual leave,*** and ***sick leave*** are called employee benefits because the employee usually continues to receive pay during the vacation period or time of illness. Some companies encourage their employees to take vacation leave at certain times during the year when they are less busy. For example, some manufacturing plants close for complete maintenance and repairs of equipment at certain times during the year.

Employees usually have to request permission to schedule vacation time. Employees who have been employed the longest may be given the first choices for vacation leave. A new employee may be required to work a certain period of time, such as six months or a year, before vacation leave can be taken.

The amount of vacation leave and sick leave allowed each employee varies from company to company. In some businesses, each employee accrues (earns) a certain number of hours of annual leave and sick leave for each month of employment. In other companies, each employee is assigned a specific number of days per year that can be used as sick leave and annual leave. Some companies require that employees use all leave by a certain date during the year. Other companies allow employees to collect sick leave over a period of time without losing it due to not using it.

It is important that employees use sick leave wisely. Sick leave should be used only for medical reasons. Depending on company policy, the employee may have to provide the personnel office with a written statement from a doctor verifying why sick leave is taken.

Uniforms and Dress Codes

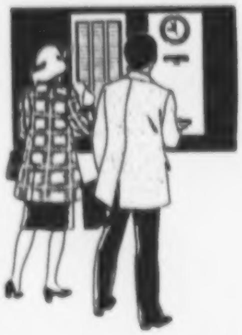
Each business may establish a dress code and grooming requirements for its employees. Such requirements are set in order to serve the needs of the business and its staff. A company's dress code may be specific or unstructured. Usually, a dress code is related to the types of clothing that are acceptable for employees while they are at work. General grooming requirements may also be identified for employees. Dress codes and grooming requirements help employees project the positive image that a business desires.

Some jobs require employees to wear uniforms. Uniforms help identify employees of a firm and encourage a clean, neat appearance. Some businesses provide uniforms at no cost to employees or provide discounts on the purchase price of uniforms. If employees must buy their own uniforms, they should keep records of the purchases for use in figuring federal income tax deductions.

If uniforms are not required, it is important for each employee to wear clothing appropriate for the assigned job responsibilities. It is also very important for each employee to consistently use good grooming habits. Being clean and neatly groomed is the factor that can project a good image to the public. A pleasant appearance shows that the employee cares about himself or herself and about the business.

Use of Time Clocks

Most businesses pay some employees based on the number of hours they work. In order to accurately calculate hours worked, each employee paid by the hour is required to use a time clock to record exactly when he or she arrives at work and leaves work. A ***time clock*** is a device that is usually placed near the employee entrance to a business. The employee inserts a time card provided by the employer in the time clock upon arrival and departure each day. The time clock stamps the time on the card so that work hours are recorded. In some businesses, all employees are required to use a time clock whether they are paid hourly wages or not.



Identification Badges

Some businesses provide identification badges for all employees to wear. Each badge usually shows the employee's name and title or department. Wearing an identification badge helps customers know that the person is an employee of the company. Identification badges can also help make the contact between an employee and a customer more personal since the badge helps the customer remember the employee's name.

Security in large businesses with many employees and large numbers of customers is a major concern of management. Identification of employees with badges is sometimes done to help with security. The background color of badges or identifying symbols on the badges allow employees and security personnel to determine if employees are in appropriate areas. Background colors of badges may also indicate time periods and may be issued each year.

Work-Related Injuries

Any injury received while on the job should be reported immediately to a supervisor. If medical attention is required, prompt reporting ensures that the employee will get the help needed. The supervisor is responsible for reporting the employee injury to management. Information must be given about the cause of the injury, the required medical treatment, and the amount of work time lost as a result of the injury. Witnesses to the injury must be named for workers' compensation reports.

When an employee cannot work as the result of a work-related injury, he or she may be eligible for workers' compensation benefits. As described in Chapter Three, workers' compensation is an insurance policy provided by most employers to insure the company against liability involving injuries received by employees while working. If an employer has this type of insurance, the injured employee can receive medical treatment and a portion of the wages that he or she would normally have been able to earn.

Complaints and Grievances

A ***complaint*** or ***grievance*** is an employees' formal expression of disagreement that may be related to a variety of situations. An employee may choose to submit a formal complaint about issues such as work hours, working conditions, performance appraisals, merit raises, interpretation of the official personnel or administrative policies, oral or written reprimands, or job assignments. The employee should first discuss any problem with an immediate supervisor. If no solution is reached, the employee may submit a written complaint to the second level supervisor for further consideration.

Employees should follow company policies when submitting formal complaints or grievances. Formal complaints and grievances are only submitted if the employee has a serious and legitimate disagreement with a work situation. Employees who constantly complain contribute to a negative work environment. Remember that no work situation is perfect and that calmly discussing complaints with a supervisor usually solves problems. Avoid gossiping with other employees about complaints and grievances. Using the company guidelines for grievances or complaints is the best method for correcting problems.

Labor Unions

In the textiles and apparel industries, some workers are members of labor unions. A ***labor union*** is a group of employees who join together to have a stronger voice with management. A representative elected by the union membership works with management to negotiate better working conditions, more competitive salaries, increased benefits, and fair treatment of workers. The union representative may also discuss complaints or grievances with management representatives. Membership requirements for a labor union are determined by the state in which the union operates and by company policies. Union members agree to follow union rules and procedures. Dues are required and can be expensive. If membership in a union is required, the company is known as a ***closed shop***. If membership is optional, the company is known as an ***open shop***.

ORGANIZATIONAL PROCEDURES

Every business establishes certain procedures to be followed by employees. Some procedures involve tasks that are done frequently. Other procedures should be followed in special circumstances. Specific standards are set for employees' job performance. Work schedules are also established by management and are followed by employees.

Standard Operating Procedures

Standard operating procedures (SOPs) are written procedures for those tasks that are done on a regular basis. They serve as operating guidelines for a business. SOPs are commonly used for daily routines, lost-and-found policies, time card procedures, inspection checklists, key control, performance appraisals, and inventory control. SOPs ensure that tasks are done the same way by all employees each time the task is required. A standardized result improves the image of a business with customers and makes the operations of the business more efficient.

SOPs standardize routines so that all employees know what is expected of them in each situation. The use of SOPs ensures that the task will be completed in the same way each time it is done regardless of which employee is doing it. SOPs outline responsibilities and duties in the order they are to be done during a shift. Sometimes, the times that tasks should be performed are also identified. SOPs usually contain a general statement followed by procedures and methods of record-keeping. The SOP often states penalties for not following the proper procedures.

A procedures manual is often provided to employees to help them perform their assigned tasks. The ***procedures manual*** is a document that explains exactly how to perform each step of a particular job. The manual is written in language that can be clearly understood, is listed in logical order, and includes photos or drawings where appropriate to help clarify instructions.

The new employee should read the procedures manual carefully, learn the procedures that apply to the assigned job, and write questions to be discussed with the supervisor. It is best to ask questions and be informed than to be uninformed and make mistakes on the job.

A procedures manual describes how a job is currently done. Such instructions should not be considered final. New supplies, equipment, and techniques are often introduced. Employees frequently suggest better and more efficient ways to perform certain aspects of their jobs. Changes in administrative policy, physical property, numbers of employees, and other factors can result in changes in basic procedures used by a business.

Many businesses encourage employees to find better ways to perform tasks. Incentive awards may be given to employees who improve operating procedures. An improved procedure is used by teaching current employees the technique involved, adding the procedure to the procedures manual, and training new employees in the procedure. While SOPs are not the only right ways to perform tasks, a new employee should learn and follow current procedures. As experience is gained, the employee can make recommendations for more efficient operations.

Job Performance Standards

Job performance standards are included in some procedures manuals. Job performance standards are statements of conditions that will exist when a job is performed satisfactorily. These standards are stated in precise terms clearly defining the areas, quantity, quality, and time of work. Standards should be written so they can be measured.

Performance standards are often developed by the supervisor and employee. They are used to describe the results the supervisor wants to achieve. Standards prevent the employee from having to guess what type of performance the supervisor expects. Knowing how to perform helps the employee prepare for regular performance appraisals by the supervisor.

WORK SCHEDULES

Office buildings, some manufacturing plants, and some retail stores close on weekends and holidays. Other businesses are open during weekends and holidays. There are ***peak seasons***, times when more work is required, depending on the type of business. For example, retail stores are very busy just prior to the Christmas holidays when gifts are purchased by many people. An apparel manufacturing plant may be busiest just before a shipment of clothing to a retailer. Management must schedule enough workers for the hours the business is open and for the projected business that will occur during those hours. During peak seasons, management may require or offer employees the option to work ***overtime***, extra hours in addition to their regularly scheduled hours.

Most businesses have regularly scheduled work shifts. Some businesses use rotation schedules. A ***rotation schedule*** ensures that a business has a full staff every work day, that no employee will work more than five days in any work week, and that weekend assignments are equally shared.

Shifts

Work hours vary greatly among the various types of businesses in the textiles and apparel industries. Some businesses schedule employees in shifts. Scheduling employees by ***shifts*** involves having one group of employees for each of several time periods during which a business operates. For example, a retail store may schedule one group of employees to work during the morning and early afternoon hours and another group of employees to work during the late afternoon and evening hours. Manufacturing plants often have workers who deliver shipments of merchandise during the early morning hours in order to avoid heavy traffic in large cities. Therefore, workers must be scheduled to work at various times of the day and night.

COMPENSATION OF EMPLOYEES

Compensation is payment for work done. Employees are paid using different compensation plans. Each business has policies regarding how employees are paid for the work they do. In most cases, a business will use different payment plans for different types of employees. For example, employees whose primary responsibility is sales may be paid on some type of commission compensation plan. If an employee's primary assignment involves administrative tasks, he or she is more likely to be paid on a straight salary compensation plan.

Minimum Wage

A minimum wage was first established in 1938. The original federal law called for a minimum wage of twenty-five cents per hour. Since 1938, the minimum wage has increased steadily and is projected to continue to increase. ***Minimum wage*** is the lowest amount of money an employee can be paid per hour and is set by law. As the minimum wage increases, the cost of operating a business increases in a variety of ways. Besides the increase in compensating minimum wage employees for their work, other employees usually expect a wage increase when the minimum wage increases. Most entry-level employees are hired at minimum wage. As experience is gained, hourly salaries may increase to amounts above the minimum wage rate.

Incentives

An ***incentive*** is a reward that acts as a motivation for an employee to be as productive as possible. Incentives are not offered to employees in all businesses. Incentives tend to tie performance to personal initiative. The following types of rewards are sometimes used as incentives to compensate employees:

- contests such as employee of the month programs
- bonuses in cash, services, or goods
- vacation time in addition to regular annual leave
- dollar commission on sales

In recent years, many employers have decreased the use of incentives. However, some large businesses, such as image consulting and cosmetic companies, are based on a philosophy of providing incentives to employees. These companies may offer a variety of incentives ranging from cosmetics to cars for employees who perform well.

Compensation Plans

Straight Commission – The straight commission compensation plan is primarily used to pay salespeople. A ***straight commission*** compensation plan pays an employee a specific percentage of the total volume sold. For example, an apparel salesperson might sell $10,000.00 worth of merchandise in one month. If paid on a straight commission basis of 8 percent of volume, the person would earn $800.00 during the month. This form of compensation is decreasing in use for two reasons. First, it tends to result in salespeople being overly aggressive in trying to sell merchandise to customers. In addition, it offers the employee little security since one is never certain how much money will be earned during each pay period.

Salary Plus Commission – The ***salary plus commission*** method of compensation includes a set salary plus a percent of each sale as an incentive. Salary plus commission is very common in department and specialty store retailing, as well as nonstore retailing. It offers an employee a minimum level of security in a job. It also creates an incentive for the salesperson by tying performance to the paycheck. This payment plan is also used by many apparel manufacturers to pay people who work in production. Sewing machine operators may be paid a base salary and additional money based on the amount of work they produce. The salary plus commission plan encourages growth and rewards extra effort. In addition, the plan provides a certain amount of financial security that can encourage employee loyalty to the company.

Salary Plus Commission-Over-Quota – The ***salary plus commission-over-quota*** compensation plan is a variation of the salary plus commission plan. This plan pays an employee a set salary. In addition, the employee receives a percentage of sales over a certain quota. The employee does not receive a bonus until a certain amount of work is produced. This compensation plan gives the employee a sales goal and gives the employer the security that certain amounts of merchandise will be sold before incentives are paid. Figure 5.2 provides an example of salary earnings from a salary plus commission-over-quota compensation plan.

Lonny, an accessories salesperson, receives $200.00 per week base salary with a weekly sales quota of $300.00 in merchandise. He receives 10 percent of all sales over the $300.00 quota. Lonny sold $700.00 worth of accessories in one week. The $700.00 total sales minus the $300.00 quota equals $400.00. The $400.00 over the quota is multiplied by 10 percent to get $40.00 (Lonny's commission-over-quota). Lonny's base salary ($200.00) plus commission-over-quota ($40.00) equals Lonny's total earnings of $240.00.

Figure 5.2

Straight Salary – A ***straight salary*** compensation plan offers each employee a specified amount of money for a specific number of hours worked. The straight salary plan offers less incentive to employees than some other compensation plans. Some employers feel that this plan does not motivate employees to perform well. However, in most businesses, some employees are paid by the straight salary compensation plan.

Points to Remember

- Each business is structured on the basis of goals, policies, and procedures. A mission statement is a broad statement of purpose. Other more specific goals are based on the mission statement.
- A chain of command is a structure of ranks within an organization and is often illustrated through use of organizational charts. It is important for employees to follow the company protocol and communicate through proper channels.
- Different levels exist in a business including management (the executive level), mid-management level (supervisory level), and the staff level. Each employee is accountable to a supervisor.
- Orientation is a process used to help new employees become familiar with a business.
- Various policies exist in different businesses depending on the company's mission and management. Company policies may relate to the following areas:
  –ethics
  –probation periods
  –attendance
  –performance appraisals
  –disciplinary action
  –dismissal
  –resignation
  –vacation and sick leave
  –uniforms and dress codes
  –use of time clocks
  –identification badges
  –work-related injuries
  –complaints and grievances
  –labor unions
- Standard operating procedures (SOPs) are written procedures for the tasks that are done on a regular basis. SOPs standardize routines so that all employees know what is expected of them. Procedures manuals are often used to describe how a job is currently done.
- Job performance standards are statements of conditions that will exist when a job is performed satisfactorily. These standards are often included in procedures manuals.
- Work schedules are used by management to ensure that there are enough employees scheduled for the hours a business operates. Workers are sometimes assigned schedules according to shifts.
- Compensation is payment for work done. Methods of compensation include minimum wage, straight salary, and incentives.

Words to Know

accountability
annual leave
chain of command
closed shop
code of ethics
company protocol
compensation
complaint
dismissal
employee handbook

organizational chart
orientation
overtime
peak seasons
performance appraisal
policy
policy manual
procedures
procedures manual
proper channels

ethical behavior
ethics
goal
grievance
hierarchy
incentive
incident file
job description
labor union
management
mid-management level
minimum wage
misconduct
mission statement
open shop
resignation
rotation schedule
salary plus commission
salary plus commission-over-quota
shifts
sick leave
staff level
standard operating procedures (SOPs)
straight commission
straight salary
supervisory level
termination
time clock
vacation leave

Questions for Review

1. Why is it important for an employee to use the appropriate chain of command when communicating about company business?
2. What are the three levels that may be found in a business organization?
3. In what types of situations would it be especially important for textiles and apparel employees to display ethical behavior?
4. Why is it important to attend work consistently?
5. How is vacation and sick leave earned by an employee?
6. What action should an employee take if he or she is injured while on the job?
7. Why are probation periods used with employees of some companies?
8. How is a performance appraisal usually implemented?
9. What process is used to discipline an employee?
10. What are example reasons for dismissing an employee?
11. How should an employee present a complaint to his or her employer?
12. What are standard operating procedures (SOPs)?
13. How are employee work schedules planned by management?
14. What different methods might a company use in order to compensate its employees?

6

Textiles and Apparel: Terminology, Use, and Care

ESSENTIAL ELEMENTS

- Apply correct textiles and apparel terminology.(q2A)
- Identify textile characteristics and care.(q2B)
- Relate textile characteristics to garment design, construction, alteration, and repair.(q2C)

OBJECTIVES TO ACHIEVE

- Identify the most common natural and manufactured fibers and the origins of each.
- Analyze properties of various fibers.
- Summarize how the cotton, wool, and worsted spinning systems are used to produce spun yarn of different classifications.
- Explain different methods by which fabric is produced from yarn.
- Describe various finishes used to prepare fabric for use, to influence appearance of fabric, and to improve fabric performance.
- Summarize qualities, uses, and care of various fibers and fabrics.
- Outline the fashion cycle and factors that influence consumer acceptance.

As defined in Chapter One, the word *textiles* is used to describe materials such as fibers and yarns that are used to make fabric. Cloth constructed from these materials may also be called textiles. ***Fabric*** is defined as cloth made from any textile fiber by a construction method such as weaving or knitting. ***Cloth*** is a generic term for all textile fabrics. These definitions illustrate that the terms textile, fabric, and cloth are closely related in meaning. Therefore, these three terms are used interchangeably throughout this reference book.

Becoming familiar with the most commonly used fabrics provides a basic understanding of both textile characteristics and of the procedures for handling various fabrics. In order to describe the qualities or characteristics of textile products or answer customers' questions, it is necessary to understand basic manufacturing procedures. Both natural and manufactured fibers are used to make textile products. In recent years, technological advances have allowed new fibers to be manufactured for use in making textiles and apparel products. As a result, new and improved products are now available to consumers.

NATURAL FIBERS

Fibers that grow in nature are called natural fibers. Each natural fiber can be classified as either an animal or vegetable fiber. Cotton, wool, silk, and linen are the most commonly used natural fibers. However, a number of other natural fibers exist that are used in various textile products.

Animal Fibers

Wool – The ***animal fibers*** that are used most often to produce fabric are wool and silk. ***Wool*** is the protective covering of the sheep and is sheared from the animal for processing. Wool-bearing sheep are raised in almost every country of the world. Australia, New Zealand, and South Africa are the major wool-producing countries. Other countries, including the United States, also produce a considerable amount of wool. Wool produced in the United States comes mostly from the western mountain states of Utah, Nevada, and Colorado and from the Northeast.

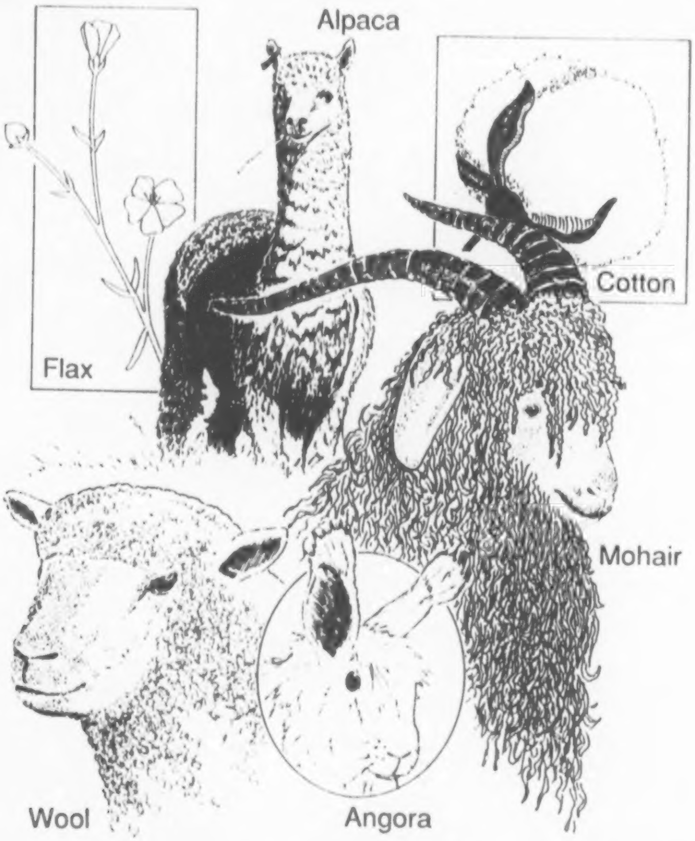
The sheep's covering that is sheared to make wool is known as ***fleece***. After sheep are sheared, raw wool is put through a ***carding*** process, a procedure that separates short fibers from long ones. Long wool fibers are spun using a special process to make smooth, compact ***worsted yarns*** used for fabrics such as gabardine and crepe. Short wool fibers are used to produce soft, dense ***woolen yarns*** used to make textured tweed fabrics. Wool is often blended with less expensive fibers to reduce the cost of the fabric or to extend its use.

Congress passed the ***Wool Products Labeling Act*** in 1939 to protect consumers, producers, manufacturers, and distributors. This act requires that all wool products be labeled and that labels identify the fiber content in terms of percentage the source(s) of the wool fiber(s). The Federal Trade Commission defines the terms that appear on the label of a wool garment according to the following guidelines:

- ***wool*** – the fiber from the fleece of the sheep or lamb or hair of the Angora or Cashmere goat (and may include the specialty fibers from the hair of the camel, alpaca, llama, and vicuña) which has never been reclaimed from any woven or felted wool product
- ***virgin wool*** or ***new wool*** – wool that has never been used or reclaimed from any spun, woven, knitted, felted, bonded, or similarly manufactured product
- ***recycled wool*** – fiber made from previously produced wool fabric that may or may not have been used by the ultimate consumer, through a reprocessing procedure, the wool fabric is returned to a fibrous state for use in making other textile products

Recycled wools are often made from the cutting scraps left when wool items are manufactured. In the reprocessing of wool, fibers may be damaged. As a result, recycled wool is sometimes lower in quality than some new wool. Less frequently, wool is recycled from fabrics used by the ultimate consumer. These are the lowest quality wool fibers because they have been used and reprocessed. Recycled wools are commonly used to make interlining fabric for coats and jackets and for inexpensive wool products. It is impossible to tell by looking at a piece of fabric whether the wool it contains is new or recycled. Therefore, the labeling information on a wool product is very important.

Silk – ***Silk*** is the product of the silkworm and is obtained from the silkworm's cocoon. Silk is called a ***filament fiber***, one long continuous fiber. The silkworm makes its cocoon as a shell to protect itself during its transformation from caterpillar to moth. Silk harvesters unwind the filament from the cocoon onto silk reels. A typical cocoon will produce 1,000 yards of continuous yarn. The four kinds of silk fibers are cultivated silk, wild or tussah silk, douppioni silk, and waste silk. Silk harvesting, removal of the silk filament from the cocoon, is done by hand and requires much patience. Thus, silk is rather expensive. Japan is the largest producer of silk fiber, followed by China, India, Korea, and Italy. Silk mills in the United States import silk fibers from other countries in order to produce silk fabrics.



Specialty Hair Fibers – Other animal fibers known as ***specialty hair fibers*** are also used to make fabric. As mentioned previously, these fibers are sometimes classified as wools. Examples of hair fibers include camel hair, cashmere, mohair, llama hair, alpaca, horse hair, angora, and vicuña hair.

Camel hair is obtained once each year from double-humped camels raised in all parts of Asia. As a camel's hair falls out in clumps during the spring, the hair is gathered and processed for use in fabric construction. ***Cashmere*** is obtained from cashmere goats raised in Central Asia, China, Iran, and Afghanistan. Once each year, nomadic tribesmen comb the cashmere goats to remove the hair. Each goat provides only four or five ounces of fleece per year, so quantities are limited and cashmere garments are costly.

Angora goats, native to the province of Angora, Turkey, produce ***mohair*** fiber. Angora goats are also raised in several states in the United States and in

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South Africa. In the United States, Texas is the largest producer of mohair. The llama and the alpaca (a domesticated llama), animals raised in the upper regions of the South American Andes Mountains, produce ***llama hair*** fiber and ***alpaca*** fiber. ***Horse hair*** is a specialty hair fiber that has decreased in usage recently. Horse hair is primarily used to make upholstery fabrics and backings in suits and coats. ***Angora*** fur is obtained from the Angora rabbit. This special breed of rabbit is raised in China, France, Czechoslovakia, Japan, the Netherlands, Belgium, and the United States. ***Vicuña hair*** is obtained from the vicuña, a very rare wild animal from the camel family found in the highest regions of the Andes Mountains. Vicuña hair is now rarely used since the animals must be killed to obtain the fiber. The fabric made from vicuña hair is very luxurious and expensive.

Vegetable Fibers

Cotton – ***Cotton*** is a popular natural fiber that comes from cotton plants grown in the United States, the Soviet Union, China, and India, the four main cotton-producing countries. In the United States, fourteen states in the South make up an area known as the cotton belt. Texas is the state with the largest acreage of cotton production. Cotton is a relatively inexpensive fiber to produce but the price changes with cycles in the market.

Cotton is grown in warm climates and requires a long growing season. The cotton plant has blossoms that wither and fall off leaving green pods called cotton bolls. A mass of fleecy cotton lint develops inside the seed pod or cotton boll. When the cotton boll is ripe (mature), it opens so that the cotton lint can be seen. The cotton lint is gathered by hand or by machine and ginned to separate the fiber from the seed. The fibers are further cleaned and straightened by the carding process. Cotton fiber may be processed on a combing machine that removes short fibers and naps, resulting in a smooth, uniform yarn called ***combed cotton***. Combed cotton is a very fine quality cotton. The quality of cotton depends on the length and fineness of the fiber or staple. Long-staple cottons are the finest quality cottons.

Bast Fibers – ***Bast fibers*** such as flax, hemp, jute, and ramie are obtained from the inner bark of certain plants. A process called retting (bacterial rotting) is used to loosen the fibers so they can be removed from the stalk. After the plants are dried, the woody portion is removed. A process called ***hackling*** or ***combing*** is used to separate most of the fibers and to remove the short fibers. During spinning, weaving, and finishing, further separation of fibers occurs. However, some fibers continue to cling together resulting in an uneven texture in some bast fabrics.

Flax fibers come from flax, a weedlike grass. The stem of the flax plant is used for its fiber. Flax grows in a mild, damp climate. It is grown mainly in Ireland, Scotland, Belgium, Egypt, the Netherlands, Russia, Italy, Germany, France and the Soviet Union. A limited amount of flax is grown in the northern United States. Linen, the fabric made from flax, is the oldest known fabric and dates back to the Stone Age. At one time, linen was used mainly for bedding. This explains why sheets, towels, and tablecloths are sometimes referred to as linens even though they are rarely made from linen fabric today. Flax was an important crop in the United States until the invention of the cotton gin made cotton cheaper to produce. Today, most flax fiber used in fabric production in the United States is imported.

A less well-known vegetable fiber is ramie. ***Ramie***, sometimes called ***grasscloth***, is a fiber obtained from a shrub grown in hot, humid climates in China, Egypt, Kenya, and the United States. In the United States, ramie is grown in the Everglades region of Florida. ***Jute*** comes from fibers in a wooded stalk of a plant grown primarily in India. It is the cheapest textile fiber and the second most widely used vegetable fiber, ranking next to cotton. Most jute is used for bags for sugar, coffee, and other products and in carpet backing, rope, cordage, and twine. ***Hemp*** is another vegetable fiber. Hemp is grown in several regions of the world including parts of the United States. Hemp is not as fine in quality as flax so it has never been used extensively for apparel fabric. Because it is a very strong fiber, hemp is used for twine, cordage, and thread used for stitching shoes. Hemp is considered one of the less important fibers.

MANUFACTURED FIBERS

Manufactured fiber is obtained by processing raw material or chemical substances. The process of making manufactured fiber differs from the process of making natural fiber. The main difference is that at some point during manufacturing, the substance used to produce manufactured fiber is not in a fibrous state. Manufactured fiber is sometimes called synthetic fiber or man-made fiber.

Some manufactured fibers have bases of natural plant ***cellulose*** (a carbohydrate that makes up the major part of all plant life). Other fibers are based on protein found in natural products. Some manufactured fibers are made from sand or rubber from rubber trees. The process used to manufacture fibers first involves changing a basic raw material into a thick liquid or solution. The solution is then forced through small holes in a device called a ***spinneret***. This process is called ***extrusion*** and results in the solution coming out of the spinneret in very fine liquid streams. The fine liquid streams harden into solid, continuous fibers called ***filaments*** or filament fibers.

Manufactured fibers are stretched either while they are hardening or after they have hardened. Stretching reduces the fiber's ***denier*** (diameter) and rearranges the molecules allowing the fiber to stretch without breaking. The denier of a manufactured fiber indicates its thickness and depends on the design of the spinneret used to make the fiber. Very thin strands are used for sheer fabrics in items such as pantyhose. Very thick strands of manufactured fibers are used to produce items such as tires. Besides manufactured fibers being produced in different denier, they are also made in different shapes for different products. For example, fibers made in certain shapes are used to make carpets because they show less soil and dirt.

A fiber manufacturer sometimes adds certain additives to the solution before it is extruded. Such additives may produce colored fibers or may create a certain finish on the fiber such as flame-resistance. If colors are added to the solution before it is extruded, the process is called solution dying and the fibers are referred to as being ***color sealed***. Color-sealed manufactured fibers have a high degree of ***colorfastness*** meaning the color does not fade easily over time.

The two basic types of manufactured fibers are cellulosic and noncellulosic. ***Cellulosic fibers*** are produced from cellulose, the fibrous substances found in plants. The three cellulosic fibers are rayon, triacetate, and acetate. ***Noncellulosic fibers*** are made from molecules containing different combinations of carbon, hydrogen, nitrogen, and oxygen. These substances are obtained from petroleum, natural gas, air, and water. Fiber chemists link these molecules into long chains called ***polymers***.

Cellulosic Fibers

Rayon was the first manufactured fiber. In 1889, a French chemist exhibited fabrics he called artificial silk. This fiber was originally made from the juice of mulberry leaves. Half a century later, artificial silk became known as rayon. ***Acetate***, introduced in the United States in 1924, was the second manufactured fiber produced from cellulose. ***Triacetate*** was the third cellulosic fiber to be introduced. All three of these cellulosic fibers are made from modified wood pulp that is dissolved into a liquid and extruded through the spinneret.

Noncellulosic Fibers

Noncellulosic fibers are made from several polymers. All noncellulosic fibers are made of carbon and hydrogen. Some fibers contain oxygen and nitrogen while others have chlorine as an ingredient. The polymers are usually melted or dissolved and extruded through the spinneret.

The Federal Trade Commission (FTC) has assigned generic names to several noncellulosic fibers. A ***generic name*** is the official name given to a fiber. The fibers with generic names are all significantly different in their chemical compositions. Each generic fiber is composed of a specific polymer or combination of polymers as defined by the Federal Trade Commission. If a manufacturer invents a new fiber with chemical and physical properties that is very different from the existing fibers, the FTC assigns a new generic name to the fiber. When a generic fiber is changed only slightly, the fiber is called a ***variant***. The following list includes generic names of noncellulosic fibers:

- acrylic
- anidex
- aramid
- azlon
- glass
- lastrile
- metallic
- modacylic
- novoloid
- nylon
- nytril
- olefin
- PBI
- polyester
- rubber
- saran
- spandex
- sulfar
- vinal
- vinyon

High-Tech Tip

A substance called polytetrafluoroethylene (better known as Teflon) was discovered accidentally by a chemist trying to find a new refrigerant gas. The company that developed Teflon first applied it to the surface of pots and pans to prevent food from sticking. Teflon has been used in making space suits for astronauts and the nose cone and re-entry heat shields for spacecraft. Because of its water resistance, Teflon was used as a rain and stain repellent for military apparel. Now, the substance is used to provide stain and soil resistance to a variety of textile products including fashion apparel and home fashion textiles (including mattress and pillow ticking, draperies, bedding, upholstery, carpet, and shower curtains). The substance allows easy maintenance by the consumer and protects fabric during handling at the mill and during transportation.

When a manufacturer invents one of the generic fibers, the fiber is assigned a brand name or ***trademark*** besides the generic name. The trademark is registered with the United States Patent Office. At that point, the manufacturer who produced the fiber is the only one who can use the registered name or give other manufacturers permission to use the name. Some generic fibers, such as polyester, have many different manufacturers and many different trademarks. It is important to understand the difference between trademarks and generic fiber names. Table 6.1 includes examples of the generic names and trademark names of several manufactured fibers.

Manufactured Fiber Names

Generic Names	Trademark Names
Acetate	Celebrate, Chromspun, Estron, Loftura
Acrylic	Acrilan, Creslan, Orlon, Zefkrome, Zefran
Nylon	Cantrece, Crepeset, Patina, Zafran, Zeftron
Olefin	Avtex, Elustra, Nouvelle, Spectra, Tolaram
Polyester	Dacron, Fortrel, Kodel, Trevira
Rayon	Avril, Coloray, Softglo, Zantrel 700

Table 6.1

FIBER CHARACTERISTICS

Different fibers have different characteristics or properties. These properties are determined by the fiber's external structure, chemical composition, and internal structure. The characteristics of a fiber affect the characteristics of fabric made from that fiber. In addition, the yarn, the finish, and the way a fabric is constructed all affect the type of fabric that results. Understanding the characteristics of different fibers helps one understand how fabrics look, feel, and perform. Table 6.2 includes examples of fiber properties and definitions of the properties. These terms are used throughout the textiles and apparel industries to describe fibers and fabrics and are used throughout this reference book. Understanding these basic terms helps in any apparel or textiles employment situation.

FABRIC PRODUCTION

When fabric is produced, specific steps are followed. Fibers are first converted into yarn. ***Yarn*** is a continuous strand of textile fibers, filaments, or material suitable for processing into a textile fabric. Yarn is used to make fabric. The newly constructed fabric is used to make various consumer goods.

Production of Yarn from Fiber

The two main types of yarns are filament yarns and spun yarns. As noted previously, a filament is a single continuous fiber. Silk is the only natural filament fiber. All manufactured fibers are produced as filaments. Manufactured fibers are shipped to textile mills as monofilament yarn, multifilament yarn, tow, staple, and sheet structures. A ***monofilament yarn*** is a single filament of continuous length. A ***multifilament yarn*** is made of two or more continuous monofilaments twisted together. ***Tow*** is made of large bundles of continuous monofilaments assembled but not twisted together. ***Staple*** is made by crimping and cutting tow into short lengths of about one to four inches. In some cases, polymers are extruded as wide sheets of film that are slit into narrow strips. Some natural fibers such as cotton, linen, and wool are classified as staple fibers because they are short in length. Staple fibers must be both spun and twisted to produce yarns.

Properties of Fibers	
Abrasion resistance	ability to withstand rubbing or abrasion
Absorbency	ability to absorb liquid and the rate at which the fiber will absorb
Chemical reactivity	effect of acids, alkali, oxidizing agents, and solvents on a fiber
Cohesiveness	ability of fibers to cling together during spinning
Cover	appearance of fullness and density; a high amount of bulk for its weight
Creep	ability to graduallly recover from strain or gradually stretch under a constant load
Crimp	a wavy physical structure
Density	weight of a fiber in grams per cubic centimeter
Dyeability	ability to receive coloration by dyes
Elastic recovery	ability to stretch and return to original length
Elongation	ability to be stretched or lengthened
Feltability	ability of fibers to mat together
Flammability	ability to ignite and burn
Flexability	ability to be bent or folded
Hand	the feel of a fiber such as silky, soft, or crisp
Heat conductivity	ability to conduct heat away from the body
Luster	amount of light reflected by a fiber
Loft	ability to spring back to original thickness after being flattened or compressed
Mildew resistance	ability to resist the growth of fungus
Pilling	formation of pills (balls of fibers) on the surface resulting from abrasion
Resiliency	ability to spring back to its natural position after folding, creasing, or deformation
Stiffness or rigidity	resistance to bending or creasing; opposite of flexibility
Strength	ability to withstand pressure without tearing, breaking, or bursting
Sunlight resistence	ability to withstand direct sunlight without harm

Table 6.2

Yarn made from natural or manufactured continuous filament fibers is referred to as ***filament yarn.*** Filament yarn is made by twisting together several strands of filament fiber. ***Spun yarn*** is produced by twisting many staple fibers together. There are specific spinning systems used to spin yarn from staple fibers. These systems are the ***cotton system***, the ***wool system***, and the ***worsted system***. Although these three spinning systems bear the names of three specific natural fibers, the processes are actually used to produce spun yarn from various types of natural and manufactured staple fibers. Table 6.3 summarizes the steps involved in these three spinning systems.

Fabrics made from filament yarns have a different appearance than fabrics made from spun yarns. Fabrics made from filament yarns have a smoother surface and more luster. Fabrics made of spun yarns are often fuzzy unless the fuzz is removed or flattened by a special finishing process. Yarns used for decorative or textured effects can be produced by variations in the spinning and twisting processes.

Cotton Spinning System

1. Fibers are blended in blending machines. The blending process loosens and separates the closely packed fibers, removes dirt and other impurities, and blends the fibers into a uniform mixture.
2. Picking is done by machines that clean fibers further and form them into forty-five-inch-wide laps of fibers.
3. The carding process involves more cleaning, removal of fibers too short for yarns, and partial straightening of fibers so they are parallel.
4. The combing process is used on some fibers; it involves further cleaning and straightening. More short fibers are removed. Fibers are formed into combed slivers (continuous, ropelike strands of loosely assembled fibers without twist).
5. Drawing follows either carding or combing. Several slivers are combined and pulled together. The combined slivers are drawn out into a new sliver no larger than one of the original slivers.
6. A sliver is reduced in size to make a roving. The roving is slightly twisted in preparation for spinning.
7. Spinning is the last stage in yarn manufacturing. The yarn is stretched and the desired amount of twist is used. Several spinning methods are used by different yarn manufacturers.

Wool and Worsted Spinning Systems

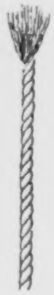
1. Fleece is pulled apart and fibers are sorted. Sorting may be done according to fineness, strength, and/or width and length of the fibers.
2. Scouring involves washing in warm soapy water several times, followed by thorough rinsing and drying. Scouring is not necessary when processing manufactured fibers.
3. Carding involves further removal of matter such as twigs and burrs. The process also straightens fibers and arranges them in a parallel position.
4. Combing, an additional straightening process, is done if the fibers are to be made into worsted yarns. Woolen yarns are not combed.
5. Spinning is the last step in converting fibers to yarn.

Table 6.3

Classification of Yarns

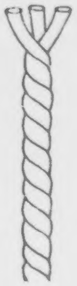
Slub yarns have soft, thick, untwisted areas at intervals creating a textured effect. ***Ratine yarns*** have small, tight loops on the surface. ***Bouclé yarns*** are not twisted as tightly as ratine yarns and the loops are more pronounced. ***Crepe fabrics*** have a pebbly texture produced by using very tightly twisted yarns and alternating the direction of the twist. A ***stretch yarn*** has the ability to stretch when pulled and will return to its original size when released. A ***bulk yarn*** has a soft, thick, fuzzy appearance. Both stretch and bulk yarns are created by producing a permanent curl, loop, or crimp along the filament. The yarn is then heat-set and untwisted.

Yarns are sometimes described by their ply. ***Ply*** refers to the number of strands or yarns twisted together. A ***single-ply yarn*** consists of only one strand of yarn. A ***multiple-ply yarn*** can be separated into several strands of yarn. ***Cord yarn*** is two or more multiple-ply yarns twisted together. Most fabrics are made from single-ply yarns. Multiple-ply yarns are mainly used to construct very durable garments such as work clothes or are used when fibers are very fine and fragile.



Single-ply Yarn

Yarns are classified as simple yarns or blended yarns. A ***simple yarn*** is made of only one fiber, such as silk. A ***blended yarn*** is made of two or more fibers spun together. The advantage of blending fibers is that the good properties of both fibers are obtained. For example, if polyester and cotton are blended, the resulting fabric is absorbent like cotton and requires little or no pressing due to the polyester fibers. A ***combination yarn*** is a multiple-ply yarn with each ply made of a different fiber.

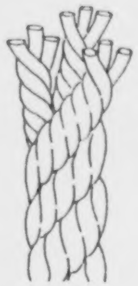


Multiple-ply Yarn

Production of Fabric from Yarn

Fabric is produced by felting, bonding, weaving, or knitting. ***Felting*** is a process in which fibers (not yarns) are pressed together to form fabric. Only certain fibers such as wool, hair fibers, and fibers from fur-bearing animals are felted. Fibers are moistened, exposed to steam, and passed between rollers causing the fibers to be matted together.

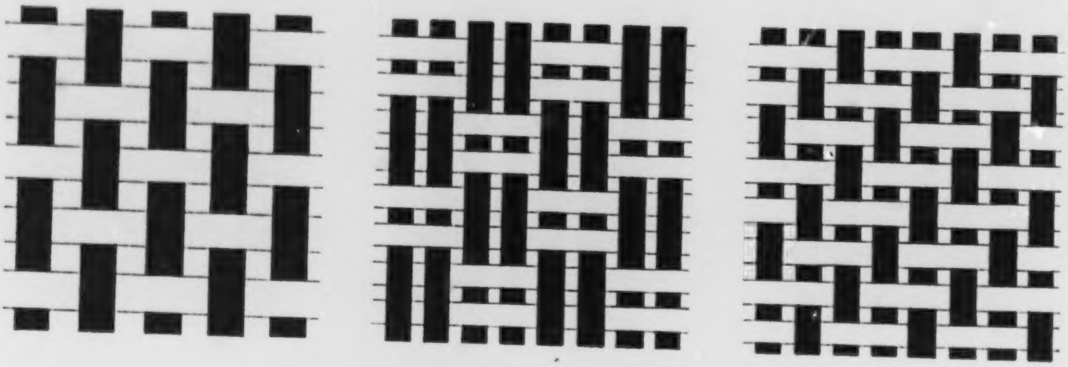
Bonding involves use of an adhesive substance to hold together either fibers or separate layers of fabric. ***Nonwoven fabrics*** that consist only of fibers are bonded. Interfacing material (a layer of fabric used to give a garment support and shape) is an example of a nonwoven, bonded fabric. In some cases, a lining is bonded to an outer fabric, preventing the need for a separate underlining.



Cord Yarn

The weaving process involves interlacing two or more yarns at right angles to each other. ***Woven fabrics*** are made of warp yarns and weft (or filling) yarns. ***Warp yarns*** are lengthwise yarns woven along the entire length of the fabric. ***Weft yarns*** are crosswise yarns woven across the fabric. Warp yarns are parallel to the selvage. The ***selvage*** is a narrow woven edge made with special, strong yarns that are woven tightly to prevent raveling. Different weaving patterns are used to create different appearances. Three basic weaving patterns are the plain weave, the basket weave, and the twill weave. Figure 6.1 shows illustrations of these three weaves.

Knitted fabrics are made by looping or interlocking yarns together. There are two basic kinds of knitting. ***Weft knitting*** (filling knitting) is similar to hand knitting and is done with only one yarn. Jersey is an example of a weft knit fabric. A disadvantage of this kind of knitting is the tendency for the fabric to run if a thread is broken. ***Warp knitting*** involves the use of several yarns at one time and is done by the flat (straight) knit method. Warp knit fabrics are stronger and more firm than weft knits. However, they do not stretch as easily. Tricot, a run resistant fabric, is an example of warp knitting.



Plain Weave

Basket Weave

Twill Weave

Figure 6.1

FABRIC FINISHES

After yarns have been woven or knitted into fabric, several processes must be followed before fabric is sold to consumers or used to make consumer goods. As discussed in Chapter Two, the fabrics that come from the loom or knitting machine are called greige goods or gray goods. Finishes are applied to fabrics for different reasons. Some finishes simply make greige goods usable. Some finishes make fabrics more attractive by changing the appearance or texture. Other finishes may improve the performance of fabrics by adding desirable characteristics.

Finishes that Prepare Fabrics for Use

Cleaning is done by washing, scouring, or dry-cleaning to remove foreign substances from greige goods. ***Bleaching*** is necessary to remove all natural coloring in the fibers. Usually, chemical bleaching is done. However, cotton may be bleached by washing and exposing the fabric to the sun. Linen may be bleached by long exposure to sunlight, air, and moisture.

Processes may be applied to fabrics to achieve ***shrinkage control***. Shrinking may be done by using chemicals, water, or steam. Labeling in textile products may include the terms ***shrunk*** or ***preshrunk*** to indicate that shrinkage control has been applied to the item. The label on a textile product must also state how much additional shrinkage (in percentage) may occur when the fabric is washed or cleaned.

Singeing is a process that leaves a smooth surface by removing any unwanted substance from fabric. By passing fabric rapidly through a flame, lint, threads, fuzz, and fiber ends are removed. ***Calendering*** is an ironing process used to smooth and press fabric.

Tentering is a process used to cause irregularly shaped cloth to be stretched or shrunk until it is even. Tentering causes the lengthwise and crosswise yarns to be at right angles to each other if done properly. Fabric is ***on-grain*** when the lengthwise and crosswise yarns are at right angles. Fabric is ***off-grain*** if the lengthwise and crosswise yarns are not at right angles. Fabrics that are off-grain are not of high quality and cause textile products to be inferior. For example a skirt made from off-grain fabric will not hang evenly. Jeans made from off-grain denim may have seams that do not hang straight.

Crabbing is a process used on wool fabric to set the width and position of the yarns. The process involves moving fabric over rollers with exposure to steam and cold water. The fabric is then pressed.

Finishes that Affect Appearance

Mercerizing is a chemical process that may be applied to either yarn or fabric. The process produces luster in cotton and linen. The yarn or fabric is treated with a caustic soda solution under tension. Then the yarn or fabric is rinsed, exposed to a warm acid bath, rinsed, and dried. Mercerization also strengthens the fibers and makes them more absorbent.

Sizing involves adding a substance to a fabric to give it additional firmness, weight, and stiffness. A starch may be added that is temporary and will wash out or a permanent chemical sizing may be used that lasts the life of the garment. Poor-quality, loosely woven fabric may be sized in order to give the appearance of being closely woven. If a soluble starch is used, the sizing will wash out of the fabric.

Napping produces a fluffy, soft-textured fabric by brushing up fiber ends that extend from the surface of the fabric. ***Nap*** is the surface fuzziness that results. Cotton and wool flannels are examples of fabrics finished with the napping process. ***Shearing*** is a process used to cut the thread ends of napped fabrics and pile fabrics to an even length so that the surface is smooth and regular. ***Sueding*** is a variation of brushing and napping in which the fiber ends are sheared very close to the surface of the fabric. The ***embossing*** process involves running fabric through heated, engraved rollers to transfer a design onto the fabric. Textured effects are produced.

Dyeing and printing are processes used to add color to fabric. ***Dyeing*** may be done by any of the following processes during different stages of fabric construction:

- ***stock dyeing*** – Dye is added to the fibers before yarn processing is done.
- ***solution dyeing*** – Dye is added to the solution before manufactured fibers are extruded.
- ***yarn dyeing*** – Dye is added to the yarns before weaving or knitting.
- ***piece dyeing*** – Fabric is dyed after weaving.
- ***resist dyeing*** – The yarn or fabric is treated before dying so the treated portion resists dye.
- ***cross dyeing*** – Piece dyeing is done to fabric containing certain fibers that absorb different dyes.

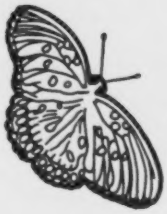
Regardless of the stage in which dyeing is done, the substance is immersed in a solution so that the dye completely saturates it. Some manufactured fibers are dyed in the solution stage before the solution is forced through the spinneret to form filaments.

Printing is a process used to apply patterns or color designs to fabric. When a fabric is printed, it is easy to distinguish the right and wrong sides of the fabric. The printed side of the fabric is more distinct than the wrong side since the color does not penetrate the fabric completely. When a fabric is dyed, the colors are usually the same on both sides of the fabric. Different types of printing include engraved roller printing, screen printing, and heat transfer printing.

Engraved roller printing involves use of a separate roller engraving for each color in a pattern. The design is rolled onto the fabric as it passes through the printing machine. ***Screen printing*** can be either flat-bed screen printing or rotary screen printing. Both types of screen printing involve forcing color through a porous screen onto fabric. The areas of the fabric that are not to be printed are covered or coated with enamel. ***Heat transfer printing*** involves the use of rotary screens or rollers to print dye onto paper. The paper and fabric are put through hot rollers so that the dye is transferred from the paper to the fabric.

Finishes that Improve Performance

Wrinkle resistance can be achieved by applying a finish to fabrics such as cottons, linens, and spun rayons. The finish makes the fabric resistant to creasing or wrinkling, perspiration, odor, and mildew. Wrinkle resistant finishes produce improved wash-and-wear qualities. Little or no ironing is required after laundering. Wrinkle resistant fabrics are not as absorbent; static electricity may accumulate; and grease and oil stains are difficult to remove.



Water-repellent finishes prevent fabrics from absorbing water. Substances are used to coat the fabric to prevent absorption of water. To make fabric totally waterproof, it must be coated with rubber or plastic which closes the pores.

Mothproofing is done by applying chemicals to wools or wool blends to protect the fabric from damage by moths. The finish is permanent and withstands washing and dry cleaning. ***Insulation*** is achieved by finishes that add warmth to a fabric without weight. Metallic particles are sprayed on the fabric to keep body heat in and prevent cold air from entering. Stain-resistant finishes are used to protect fabric from stains as well as making fabric water repellent.

When wash-and-wear chemical finishes are added to fabrics, quicker drying is possible and little or no ironing is needed. A durable press finish provides a no-iron, permanently pressed finish.

QUALITIES, USES, AND CARE OF FIBERS AND FABRICS

Knowledge of fabric characteristics is important when constructing, altering, and caring for garments. Fabric construction, fiber content, and yarn construction all work together to determine such qualities as the appearance, hand, strength, absorbency, warmth, and beauty of a fabric. These qualities directly influence the performance of a fabric in terms of wear and care.

Many different types of fabrics are available today. In addition to fabrics made from natural fibers and manufactured fibers, there are fabrics that result from blending or combining different types of fibers. The combinations and resulting fabrics are endless. Refer to table 6.4 for examples of natural fibers and to table 6.5 for examples of manufactured fibers that are used in fabric construction. The tables provide a summary of the general characteristics of the identified fibers, common uses of the fibers, and general care guidelines.

Each type of fabric is unique as a result of the fiber content, the fabric construction methods used, and the finishes applied. In addition, each garment is unique because of the way it is constructed. Therefore, careful attention to the manufacturers' recommended care instructions is vital in order to extend the life of the fabric or garment.

Care instructions are found on ***care labels*** that are sewn into the seams of finished garments. According to the ***1972 Care Labeling Act***, all finished garments and fabric sold for making apparel must have attached labels that include procedures for regular garment maintenance. The care instructions must include specific guidelines for washing, drying, and pressing or for professional dry cleaning. Labels must be placed in garments so that they can be seen or easily found by consumers at the point of sale. If packaging hides the label, additional information should appear on the outside of the package or on a hang tag fastened to the product. Becoming aware of care labels and following the instructions on the labels, helps improve the life of each garment.

Qualities, Uses, and Care of Natural Fibers

Fibers	Qualities	Suggested Uses	Care
Camel's Hair	fine, soft, lustrous; good insulation; lightweight; relatively weak; not durable	***Fabrics:*** often blended with wool ***Apparel:*** suits, coats, & sweaters ***Other:*** blankets, ropes, paintbrushes, & industrial fiber	dry-clean, subject to damage from abrasion
Cashmere	soft, silky, luxurious, expensive	***Apparel:*** sweaters, jackets, suits, & coats ***Other:*** yarn	dry-clean, careful handling required
Cotton	absorbs dye easily; very durable; stronger when wet; wrinkles easily; absorbs moisture; dries quickly; low elasticity; low luster unless treated; comfortable in hot weather; flammable; shrinks	***Fabrics:*** lightweight fabrics such as voile & batiste; heavy & thick fabrics such as corduroy, flannel, & chenille; strong & sturdy fabrics such as denim ***Apparel:*** summer clothes such as dresses, skirts, shirts, blouses, & sportswear; underwear ***Other:*** bed linens, table linens, draperies, upholstery fabrics, towels, & slipcovers	wash; shrinks when washed; iron while damp; may dry-clean; extended exposure to sunlight causes deterioration & weakening of fiber; scorches with very hot iron temperatures
Linen	cool; lightweight; strong; stronger when wet; good hand; good luster; absorbs moisture; dries quickly; poor resistance to abrasion; poor elasticity; wrinkles easily	***Fabrics:*** fine fabrics such as handkerchief linens to coarse fabrics such as crash, a fabric used to make dish towels ***Apparel:*** summer and fall clothes such as dresses & suits ***Other:*** table linens, dish towels, tea towels, curtains, slipcovers, & upholstery fabrics	dry-clean for crispness; wash for softness; may shrink when washed; iron while damp; iron on right side to increase luster; high safe ironing temperature of 450°F
Ramie	silk-like luster; very strong; stronger when wet; excellent abrasion resistance; high mildew & rotting resistance; stiff; poor elasticity	***Fabrics:*** used alone or blended with polyester, cotton, linen, & acrylics ***Apparel:*** dresses, suits, & shirts ***Other:*** tablecloths & napkins; home furnishing materials; industrial thread; filter cloths; & fish nets	machine wash; breaks if folded repeatedly in same place; requires ironing
Silk	luxurious hand; absorbs dye well; high luster; good insulation; drapes well; very strong; good elasticity; lightweight; comfortable; beautiful; fairly durable; less strong when wet; can be attacked by moths; builds up static electricity in dry climates	***Fabrics:*** luxurious fabrics in many weights such as chiffon, crepe, satin, & jersey ***Apparel:*** fine garments such as dresses, suits, scarves, linings, & blouses ***Other:*** some used in home furnishings such as drapery & upholstery fabrics	avoid prolonged exposure to sunlight; turns yellow if exposed to chlorine bleach; dry-clean for best results; high safe ironing temperature of 300° F; use press cloth to iron; hang garment to remove some creases
Wool	good resiliency when dry; poor resiliency when wet; fair hand; good drape; good elasticity; absorbs moisture slowly; dries slowly; good insulation; little static problem; fairly durable; luster varies; can be attacked by insects; pilling occurs; flame resistant; resistant to acids	***Fabrics:*** lightweight fabrics such as challis, broadcloth, flannel, & crepe; heavier fabrics such as chinchilla cloth, tweeds, jacquards, jersey, & velour ***Apparel:*** fall & winter suits, coats, sweaters, dresses, skirts, & childrenswear ***Other:*** blankets, upholstery fabrics, rugs, & carpets	hang dry garment in a moist room to remove wrinkles; place wet garments flat to dry; dry-clean or handwash as recommended; brush garments frequently; turns yellow if washed with chlorine bleach; mothproof when storing

Table 6.4

Qualities, Uses, and Care of Manufactured Fibers

Fibers	Qualities	Uses	Care
Acetate	luxurious feel & appearance; wide range of colors; good drapability; soft; resistant to shrinkage, moths, & mildew; low strength; poor elasticity; builds up static electricity charges; melts when heated; special dyes used on acetate fade	***Fabrics:*** brocade, crepe, double knits, faille, knitted jerseys, lace, & tricot. ***Apparel:*** blouses, dresses, lingerie, foundation garments, linings, shirts, slacks, & sportswear ***Other:*** draperies, upholstery fabrics, cigarette filters, fiberfill for pillows, & quilted products	wash with care; dry-clean acetate without shrink-resistant finish; protect from mildew when storing; may be attacked by silverfish if heavily starched; avoid spilling acetone on acetate fabric because fibers will be dissolved
Acrylic	soft; warm; wool-like; lightweight; retains shape; resilient; dries quickly; resistant to moths, sunlight, oil, & chemicals; low absorbency; static electricity charges build up; ignites and burns easily	***Fabrics:*** fleece & pile fabrics, face portion of bonded fabrics, simulated furs, & jerseys ***Apparel:*** dresses, infant wear, knitted garments, skirts, ski wear, socks, sportswear, & sweaters ***Other:*** blankets, carpets, draperies, upholstery fabrics, knitting yarns, & craft yarns	different acrylic fibers vary in care; usually dry-clean or wash; use low settings on dryer; remove from dryer immediately after tumbling; high safe iron temperature of 250°F
Nylon	very strong; supple; resistant to abrasion; lustrous; easy to wash; resistant to damage from oils, chemicals, insects, & sunlight; resilent; low moisture absorbency; excellent elasticity; builds up static electricity charges; fibers melt with high heat; chemically stable; pilling occurs	***Fabrics:*** various fabrics from fine to coarse, soft to crisp, & sheer to opaque ***Apparel:*** blouses, dresses, foundation garments, hosiery, lingerie, underwear, raincoats, ski and snow apparel, suits, & windbreakers ***Other:*** bedspreads, carpets, draperies, curtains, upholstery, air hoses, conveyor & seat belts, parachutes, racket strings, ropes, sleeping bags, tents, & tire cord	machine wash and tumble dry most nylon fabrics; remove from dryer when cycle ends; shrinks when washed; remove oil-borne stains with grease solvent before laundering; wash white nylon fabrics alone
Polyester	relatively strong; resistant to stretching, shrinking, most chemicals, insects, sunlight, wrinkling, & abrasion; quick drying; crisp & resilient; retains heat-set pleats & creases; easy to wash; good elasticity; fibers melt at high temperatures	***Fabrics:*** often blended with other fibers such as cotton, silk, linen, or wool; fabrics are usually medium weight ***Apparel:*** blouses, shirts, career apparel, chidren's wear, dresses, insulated garments, ties, lingerie & underwear; permanent press garments, slacks, & suits ***Other:*** fiberfill for different products, fire hose, ropes, nets, tire cord, & sails	machine wash usually; use warm water temperatures; remove oily stains with grease solvent before laundering; remove from dryer when cycle ends; high safe iron temperature of 450° F; follow care label instructions for blends
Rayon	not strong; less strong when wet; low elastic recovery; low resiliency; very absorbent; soft; comfortable; absorbs dye well; drapes well; does not build up static electricity charges; scorches at high temperatures; ignites and burns easily	***Fabrics:*** often blended with fibers such as polyester & cotton ***Apparel:*** blouses, coats, dresses, jackets, lingerie, linings, rainwear, slacks, sport shirts, sportswear, suits, thermal underwear, & ties ***Other:*** diapers, towels, bedspreads, blankets, carpets, curtains, draperies, sheets, slipcovers, tablecloths, upholstery, medical/surgical products, & tire cord	dry-clean; shrinks if dryed in automatic dryer; high safe iron temperature of 250° F; follow care label instructions for blends

Table 6.5

CONSUMER ACCEPTANCE OF APPAREL

Fashion is a powerful influence in the lives of people. The terms fashion and style are often confused. A ***style*** is a type of product that has one or more specific features or characteristics that distinguish it and make it different from other products of the same type. For example, a blazer and a safari jacket are two different styles of jackets. One style may include many variations in decoration, texture, color, trimmings, and other details.

The individual interpretations or versions of one style are called ***designs***. When a style becomes popular, many different designs or versions of the style are produced. Each producer assigns a ***style number*** to each design in the line to identify it in production, selling, and shipping. A ***line*** is a group of clothing designed and manufactured by a firm or a designer. Fashion is defined as the prevailing or accepted style in dress adopted at a particular time. A style does not become a fashion until it is accepted by consumers. A fashion remains a fashion only as long as it is accepted by consumers.

Some styles go in and out of fashion repeatedly. For example, padded shoulders and circular skirts are styles that have been fashionable at various times throughout history. A ***classic*** is a style that continues to be accepted, to some degree, over an extended period of time. Examples of classics are cardigan sweaters and men's oxford cloth button-down collared shirts. In contrast, some styles become popular suddenly, are accepted quickly, and disappear quickly. These styles are called ***fads***. The Nehru jacket was an example of a fad that was adopted by men several years ago but quickly decreased in popularity.

High fashion is a term used to describe a very new and expensive style. Only a few people accept high fashion items because of the high cost and because only a few people are willing to adopt different styles at first. Some styles are accepted by large numbers of people. As mentioned previously, these styles are called mass fashions. Fashion is a concept that involves movement. The directions in which fashions move are called ***fashion trends***. For example, men's ties may change from wider to narrower or the athletic look in clothing may become more or less popular.

Even though fashion trends may only change slightly, certain directions can be identified. Figure 6.2 includes examples of how women's fashions have changed gradually over a period of several decades. People employed in the textiles and apparel industries must plan ahead and project fashion trends. Success in the fashion industry often depends on the ability of designers, buyers, and other employees to recognize fashion trends and changes. The term ***forward fashions*** is often used to refer to styles that are gaining acceptance.

A variety of factors influence the consumer's interest in fashion. Changes in people's attitudes and changes in lifestyles result in changes in fashion. Social influences such as changes in women's status and changes in men's roles influence fashion. Political situations influence fashion. For example, when the United States has a good trade relationship with a particular country, fashion in this country may be greatly influenced by the style of dress in the other country.

Economic influences have impact on fashion also. The amount of money consumers spend on fashion and other goods depends on their incomes. Fashion acceptance is therefore influenced by the stability of the economy. Technology also influences fashion. Mass production, transportation, and improved communication are examples of technological factors that have changed the fashion industry. Marketing is another factor that influences fashion. Marketing involves activities such as advertising and publicity used to stimulate consumer interest. Improved marketing techniques and the ability to communicate through the media have greatly influenced consumer acceptance of fashion.

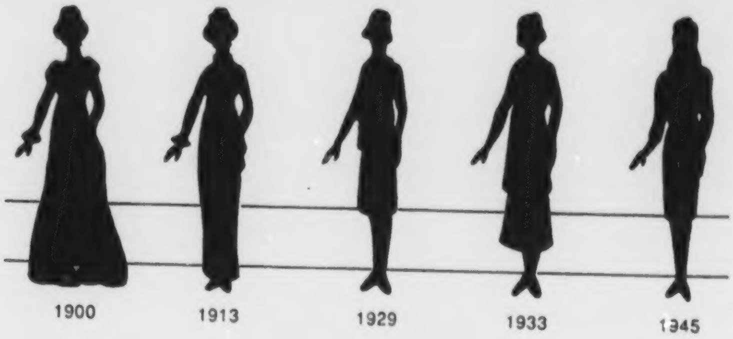


Figure 6.2

The life span of a fashion is known as a ***fashion cycle***. The five major stages in each fashion cycle are the introduction, rise in popularity, peak in popularity; decline in popularity, and rejection. The fashion cycle can be used to show the acceptance of a single style from one designer or of a general style of apparel. Different fashions vary in their life spans, in the degree of acceptance they experience, and in the rate at which they progress through the stages of the fashion cycle. Figure 6.3 shows one version of the fashion cycle. Sometimes the fashion cycle is pictured on a bell-shaped curve.

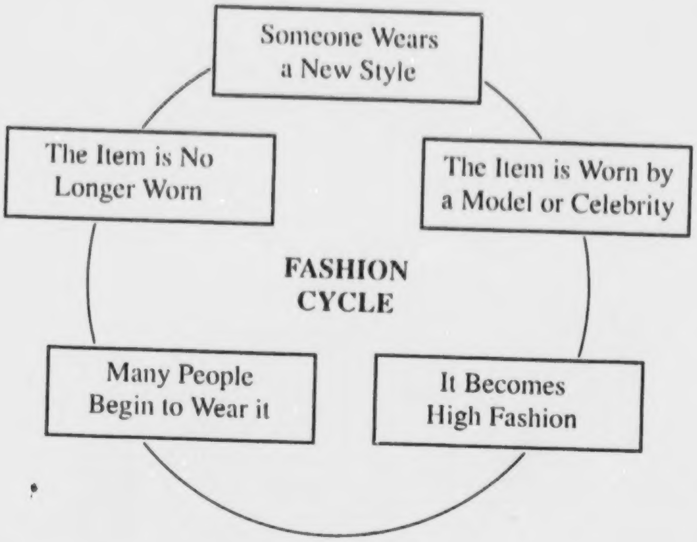

Someone Wears a New Style
The Item is Worn by a Model or Celebrity
It Becomes High Fashion
Many People Begin to Wear it
The Item is No Longer Worn
FASHION CYCLE

Figure 6.3

Points to Remember

- The terms fabric, cloth, and textiles are often used interchangeably.
- In order to describe the quality or characteristics of textile products or answer customers' questions, it is necessary to understand the basic procedures used in manufacturing such products.
- Natural fibers are classified as either animal or vegetable fibers. The animal fibers most commonly used to make consumer goods are wool and silk. Cotton and linen are the two vegetable fibers most often used to make consumer goods.
- Manufactured fiber is obtained by processing raw material or chemical substances. The process of making manufactured fiber differs from the process of producing natural fiber. The main difference is that at some point during manufacturing, the substance used to produce manufactured fiber is not in a fibrous state. The two basic types of manufactured fibers are cellulosic and noncellulosic. Cellulosic fibers include rayon, triacetate, and acetate. There are currently twenty noncellulosic fibers that have been assigned generic names.
- Generic names are assigned to different manufactured fibers by the Federal Trade Commission. When different manufacturers produce the same generic fiber, each manufacturer assigns a trademark to their product.
- Each type of fiber has different characteristics or properties. The properties of a fiber affect the characteristics of fabric made from the fiber.
- There are two main types of yarns, filament yarns and spun yarns. Filament yarns are made by twisting together several strands of fiber. Spun yarns are produced by twisting many staple fibers together. Fabrics made from filament yarns have a smooth lustrous surface. Fabrics made from spun yarns often have a fuzzy surface.
- There are three different spinning systems used to produce spun yarn. The systems are the cotton, wool, and worsted spinning systems. These systems are used to spin yarn from both natural and manufactured fibers.
- Yarns are sometimes described by their ply. Most fabrics are made from single-ply yarns.
- Yarns are classified as simple yarns, blended yarns, or combination yarns. The advantage of using blended fibers is that the desirable characteristics of both fibers are obtained.
- Fabric is produced by felting, bonding, weaving, or knitting.
- Knitted fabrics are made by looping or interlocking yarns together. Weft knitting and warp knitting are the two basic types of knitting.
- After yarns have been woven or knitted into fabric, several finishing processes must be followed before the fabric is sold to consumers or used to make consumer goods.
- Finishes are applied to make greige goods usable, to make fabrics more attractive, or to improve the fabric's performance.
- Knowledge of fabric characteristics is important when constructing, altering, and caring for garments. Fabric construction, fiber content, and yarn construction all work together to determine such qualities as the appearance, hand, strength, absorbency, warmth, and beauty of a fabric.

- Fashion is a powerful influence in the lives of people. When a specific style becomes accepted by consumers, it becomes a fashion. Fashion moves in certain directions called fashion trends. Various factors influence consumer acceptance of fashion. As fashions are accepted, gain in popularity, and decline in popularity, they go through fashion cycles.

Words to Know

acetate
alpaca
angora
animal fibers
bast fibers
bleaching
blended yarn
bonding
bouclé yarns
bulk yarn
calendering
camel hair
carding
care labels
cashmere
cellulose
cellulosic fibers
classic
cleaning
cloth
colorfastness
color sealed
combed cotton
combination yarn
combing
cord yarn
cotton
cotton system
crabbing
crepe fabrics
cross dyeing
denier
designs
dyeing
embossing
engraved roller printing
extrusion
fabric
fads
fashion cycle
fashion trends
felting
filament fiber
filaments
filament yarn
flax
fleece
forward fashions
generic name
grasscloth
hackling
heat transfer printing
hemp
mothproofing
multifilament yarn
multiple-ply yarn
nap
napping
new wool
1972 Care Labeling Act
noncellulosic fibers
nonwoven fabrics
off-grain
on-grain
piece dyeing
ply
polymers
printing
ramie
ratine yarns
rayon
recycled wool
resist dyeing
screen printing
selvage
shearing
shrinkage control
silk
simple yarn
singeing
single-ply yarn
sizing
slub yarns
solution dyeing
specialty hair fibers
spinneret
spun yarn
staple
stock dyeing
stretch yarn
style
style number
sueding
tentering
tow
trademark
triacetate
variant
vicuña hair
virgin wool
warp knitting
warp yarns
water-repellent finishes
weft knitting
weft yarns
wool

horse hair
insulation
jute
knitted fabrics
line
llama hair
manufactured fiber
mercerizing
mohair
monofilament yarn
woolen yarns
Wool Products Labeling Act
wool system
worsted system
worsted yarns
woven fabrics
wrinkle resistance
yarn
yarn dyeing

Questions for Review

1. What are the differences between manufactured and natural fibers?
2. What are the most commonly used natural fibers? What are their sources?
3. What different classification of wool might a consumer find on garment labels? What do these different terms mean?
4. What are the two basic types of manufactured fibers? What are the differences between the two?
5. What is the difference between a generic fiber name and a trademark name?
6. How do properties of fibers influence the way a fabric looks, feels, and performs?
7. What are the differences in the procedures used in the three basic yarn spinning systems?
8. What are the differences in felting, bonding, weaving, and knitting?
9. What are the differences between weft knitting and warp knitting?
10. What are the three basic types of weaves? What are the differences in the three?
11. What are the purposes of fabric finishes?
12. How do fiber qualities influence use and care of the resulting fabrics?
13. What is the difference between a style and a fashion?
14. What types of influences in our society have an impact on fashion trends?
15. What is a fashion cycle?

7

Selection of Fabrics and Notions for Garment Design

ESSENTIAL ELEMENT

- Select fabrics and notions suitable for garment design.(q3A)

OBJECTIVES TO ACHIEVE

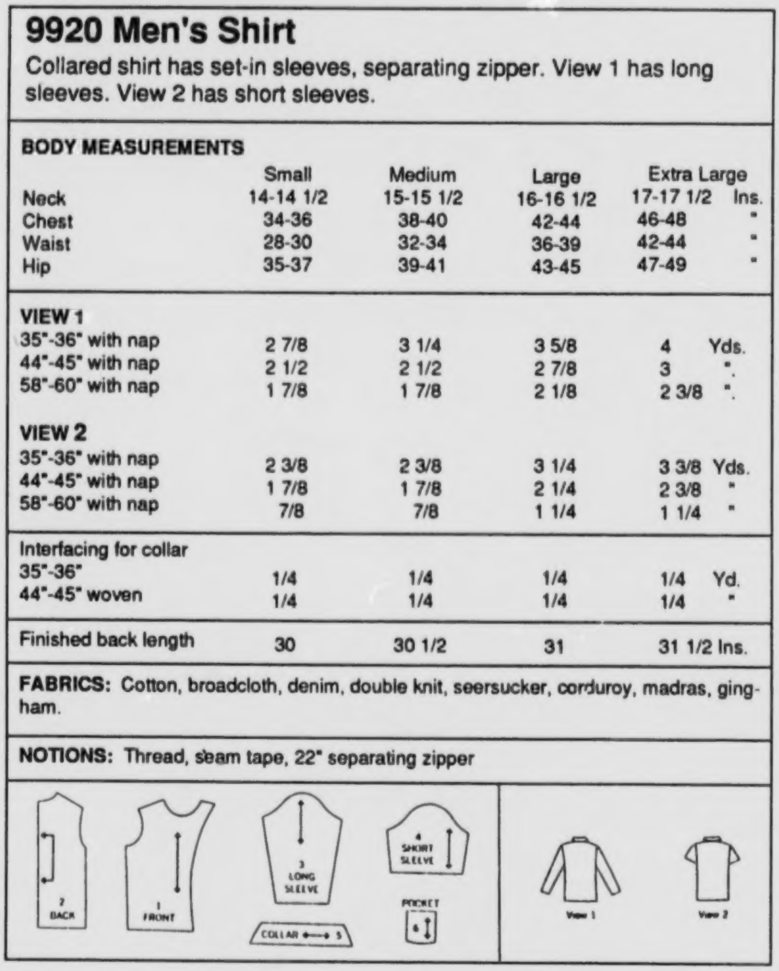
- Analyze factors to consider when selecting fabrics for apparel construction including grain, weight, and hand of fabrics.
- Identify factors to consider when selecting patterned, printed, napped, sueded, and pile fabrics.
- Describe how and why shaping fabrics are used in construction of apparel.
- Summarize methods used for estimating yardage required for sewing projects.
- Identify notions used in apparel construction.

Fabrics are important components of a variety of products. Fabric selection is especially important when designing and constructing apparel. As defined in Chapter Six, fabric is cloth made from any textile fiber by a construction method such as weaving or knitting. Notions are also important components of apparel design. ***Notions*** are items other than fabric that are used in garment construction such as thread, buttons, buckles, trim, elastic, tape, and zippers.

Since the entire look of a garment results from all of its components, fabric and notions are important influences on each garment. Fabrics and notions are chosen based on fashion trends, quality, performance, price, and suitability. Fashion trends involve certain looks that are popular at a particular time. Quality is an important consideration so that the life of each garment is extended and the person enjoys wearing the garment as long as desired. Understanding how specific fabrics and notions perform is necessary in order to ensure that the fabric and notions selected are suitable for the garment design. The price of fabrics and notions is another important factor.

SELECTION OF FABRIC FOR APPAREL

Fabrication involves selecting or creating an appropriate garment style for a fabric or selecting the right fabric for a garment design. Selection or creation of fabric is one way a fashion designer communicates artistically. Custom sewers and salespeople also use their creative abilities to help customers select fabric and garment designs. Information on fabrics recommended for the garment design is placed on the back of each commercial pattern envelope. These recommendations are useful because they give the custom sewer clues regarding the weights and types of fabrics that might be appropriate. The custom sewer or salesperson can help a customer by suggesting other fabrics with similar properties as the recommended fabrics. Figure 7.1 is an example of the back of a pattern envelope for use while reading this chapter.



9920 Men's Shirt

Collared shirt has set-in sleeves, separating zipper. View 1 has long sleeves. View 2 has short sleeves.

BODY MEASUREMENTS	Small	Medium	Large	Extra Large	
Neck	14-14 1/2	15-15 1/2	16-16 1/2	17-17 1/2	Ins.
Chest	34-36	38-40	42-44	46-48	"
Waist	28-30	32-34	36-39	42-44	"
Hip	35-37	39-41	43-45	47-49	"
VIEW 1					
35"-36" with nap	2 7/8	3 1/4	3 5/8	4	Yds.
44"-45" with nap	2 1/2	2 1/2	2 7/8	3	".
58"-60" with nap	1 7/8	1 7/8	2 1/8	2 3/8	".
VIEW 2					
35"-36" with nap	2 3/8	2 3/8	3 1/4	3 3/8	Yds.
44"-45" with nap	1 7/8	1 7/8	2 1/4	2 3/8	"
58"-60" with nap	7/8	7/8	1 1/4	1 1/4	"
Interfacing for collar					
35"-36"	1/4	1/4	1/4	1/4	Yd.
44"-45" woven	1/4	1/4	1/4	1/4	"
Finished back length	30	30 1/2	31	31 1/2	Ins.

FABRICS: Cotton, broadcloth, denim, double knit, seersucker, corduroy, madras, gingham.

NOTIONS: Thread, seam tape, 22" separating zipper

Figure 7.1

Sometimes, fabrics inspire garment designs. For example, a beautiful, soft fabric might inspire selection or creation of a garment design that has gathers. Some fashion designers select the fabric first and then create garment designs that are compatible with the fabric. Other designers tend to create garment designs and then choose fabrics that complement the identified designs. In any situation, the designer or custom sewer must imagine a garment design constructed in the selected fabric. One gains this ability through observation and experience. Besides understanding the customer's needs, selecting a suitable fabric for a particular garment design may be the most important part of the fashion design process.

Grain of Fabric

When selecting woven fabric to custom sew a garment, it is important to check fabric to see if the grain is straight. ***Grain*** is the direction of the weave in a fabric. Warp and filling yarns should intersect at right angles. When these yarns are at perfect right angles, the fabric is on-grain. Sometimes during the weaving and finishing processes, yarns may be stressed and strained so that they do not lie at right angles. In this situation, the fabric is off-grain.

To check the grain of fabric, the fabric should be folded back on itself, with the selvages matched. If the end of the fabric is torn, the torn end should be exactly at right angles with the selvage. If the fabric is cut across the end, a single crosswise thread is followed to see if it is parallel to the folded line of the fabric and at right angles to the selvage.

If the fabric has a plaid or design at right angles to the selvage, about a yard of fabric should be unrolled from the bolt. One-half yard is folded back, matching the selvages carefully. The design should be parallel to the folded line. If the design on a permanently finished garment is more than one-half inch off-grain, it can never be straightened satisfactorily. Fabrics that are off-grain less than one-half inch can usually be straightened. It is best to avoid purchasing fabrics that are very off-grain because various construction problems result. For example, a skirt may not hang evenly when constructed from off-grain fabric. Jeans sewn from denim that is off-grain may have seams that do not hang straight.

Weight and Hand of Fabrics

Fabric performance refers to the fabric's properties related to wearing and cleaning. Each fabric has specific properties resulting from fiber content, construction methods, and finishes applied. The weight and hand of a fabric are major characteristics that influence how the fabric can be used in garment designs. ***Weight*** is the heaviness or lightness and thinness or thickness of a fabric. ***Hand*** is the feel, body, and the way the fabric falls when draped. As discussed in Chapter Eight, silhouette is the outline of a garment based on the way it is designed. The weight and hand of fabric influence the silhouette of a garment.

In order for a designer or custom sewer to select fabrics wisely, it is important to know how a fabric will perform when used to construct a garment. Fabric must be chosen that is compatible with the desired garment silhouette. Fashion designers attempt to develop specific looks when designing garments. For example, a garment with a tailored look has simple, trim lines. Only certain fabrics such as worsted wools, gabardines, and linens are appropriate fabric choices for tailored garments. From experience, designers have learned that these types of fabrics perform well in tailored garments and have a crisp look. A sheer fabric cannot hold a crisp, molded shape. A stiff fabric cannot drape into a soft gather.

Soft fabrics are used in garment designs that allow the body shape to be seen. Fabrics such as crepe, jersey, challis, and chiffon are soft and work well when used with draped designs. Additional softness may be achieved in a garment design by using design details such as gathers, unpressed pleats, or smocking. Further information on various design details is provided in chapters of this reference book related to clothing construction.

Different types of garments are traditionally made of different fabric weights. For example, blouse-weight fabrics are usually lighter than skirt-weight fabrics or pant-weight fabrics. Apparel manufacturers buy fabrics in specific weights, such as a twelve-ounce wool fabric. Ounces per yard, yards per pound, and ounces per square yard are measurements that express fabric weight. Woolens, worsteds, and fabrics of similar weight made from blends or manufactured fibers are often measured in ***ounces per yard***. For example, there are fabric weights such as fourteen-ounce tweed and twelve-ounce worsted. Using this system, the higher number indicates a heavier fabric.

Yards per pound is a measure of the number of yards of fabric in one pound. Using this measurement system, higher numbers indicate fabrics that are lighter in weight. Cottons, cotton blends, and lightweight manufactured fabrics are measured using this system. One does not consider the width of the fabric when measuring ounces per yard or yards per pound. These measurements are, therefore, not as accurate as the measure of ounces per square yard. Using the ***ounces per square yard*** measuring system, the weight of a piece of fabric measuring 36" by 36" is calculated.

Fabrics are grouped into different categories according to weight. Very lightweight fabrics are fabrics that weigh less than one ounce per square yard. Examples include sheer curtain fabrics, gauzes, and mosquito netting. ***Relatively lightweight fabrics*** are fabrics that weigh from two to three ounces per square yard. In the textiles and apparel industries, these fabrics may also be called ***top-weight fabrics*** and are frequently used for shirts or blouses. ***Bottom-weight fabrics,*** also called ***medium-weight fabrics***, weigh five to seven ounces per square yard. These fabrics are commonly used for items such as skirts and slacks. ***Heavyweight fabrics*** range from nine to eleven ounces. ***Very heavyweight fabrics*** weigh over fourteen ounces. These fabrics are used for cold-weather clothing such as suits and coats.

Different fabric weights are chosen for different seasons of the year. Light, cool fabrics are used for summer clothing and heavier fabrics are used to make warm clothes for winter weather. Some fibers are traditionally used for certain seasons. For example, wool is used for many fall and winter clothes because it is heavy, bulky, and warm. Cotton is often used for warm weather because it is an absorbent, cool fabric. In recent years, manufacturers have developed fabrics that can be worn in any season. Some traditionally warm-weather fibers, such as cotton, have been used to construct bulkier fabrics for fall and winter garments. Some traditionally cold-weather fibers, such as wool, have been used to construct lightweight fabrics for spring.

Fabric Patterns and Prints

Fabrics are constructed in a variety of colors, patterns, and prints. A ***motif*** is one design printed on a fabric. When selecting patterned fabric, select a fabric with a pattern that is scaled (sized) appropriately to complement the design of the garment. If a fabric has large motifs, the fabric should be used with a simple design that allows the pattern to be seen. A large-patterned fabric may lose its appeal when cut into many pieces. Matching certain types of designs in fabrics may be impossible. Some garment designs are not suitable for obvious slanting, plaid, or striped fabrics. A complicated garment design with many seams and other details would not allow a large pattern in the fabric to be the most important element of the garment. If a garment design does include important structural lines and details, it is important that the fabric selected be plain and of secondary importance.

Some fabrics have large plaid designs and irregular stripes. Such patterns must be matched when sewing seams together. Fashion designers must recognize fabrics that will require matching of patterns. Matching patterns increases the cost of producing garments. The ***repeat*** of a print is the amount of fabric necessary for a floral or geometric pattern (such as a plaid) to duplicate itself totally. A fabric with a large repeat requires the most yardage because it is difficult to match motifs and patterns.

One-way prints are fabrics with designs printed so that the motif faces only one direction. When using one-way prints, one must cut pattern pieces in the same direction. ***Two-way prints*** are those that have motifs facing both directions. Two-way prints allow pattern pieces to be cut in both directions so cutting is simpler and fabric is saved. A ***border print*** is a fabric that has a printed or woven pattern near the edge of the fabric. The use of border prints must be planned carefully so that the fabric is not wasted and so that the fabric design complements the design of the garment.

Napped, Sueded, and Pile Fabrics

Napped fabrics and ***sueded fabrics*** are fabrics that have textured surfaces as a result of fiber ends being brushed up onto the surface of the fabric. ***Pile fabrics*** are fabrics with cut or uncut loops that stand up densely on the surface. Careful planning is important when these fabrics are used for garment construction.

Sueding develops a very low pile on the surface of the fabric which causes the surface to look and feel like suede leather. An abrasive material much like sandpaper is used to achieve the suedelike texture. Napped fabrics also have a pile or nap on the surface of the fabric but the nap is deeper.

Nap is created on fabric by rubbing the surface of the fabric with a rough instrument. Napped fabrics are usually made from yarns with a loose twist so that the surface fibers can be brushed up easily. Today, napping is done with machines that have small, fine wires. These small wires catch fibers and pull them up to the surface of the fabric. A soft, fuzzy layer of fibers is formed on the surface. The terms ***gigging*** and ***raising*** are sometimes used to describe the napping process. Fabrics intended for apparel use are usually napped on one side only. Sometimes, fabrics constructed for use in making blankets are napped on both sides.

Pile fabrics may be created by weaving or through other construction techniques such as tufting or knitting. In woven pile fabrics, an extra set of yarns is incorporated to form the pile. Woven, pile fabrics are made using a complex process in which there are at least three sets of yarns. For some fabrics, such as corduroy and velveteen, the extra yarns are cut and brushed up on the surface of the fabric. In some weaving methods, the loops are not cut. Examples include terry cloth and frisé (an upholstery fabric).

Some sueded fabrics have a similar hand and appearance to that of real suede leather. These fabrics are generally used for garments with simple design lines since the fabrics are somewhat bulky. Other sueded fabrics may be more drapeable and have a softer hand. Napped and pile fabrics are frequently used for apparel worn in cool or cold weather. The loose fiber ends trap air to serve as insulation. Sleepwear, coats, and sweaters are often made from napped fabrics. Some pile fabrics such as velvet and velveteen are used for very formal garment designs.

Sometimes, napped and pile fabrics are brushed so that the nap or pile runs in one direction. When this process has been used in constructing a fabric, the fabric is smooth in one direction and rougher in the other direction. Garment pieces cut from such fabrics must be placed on the fabric so that all pieces are laid in the same direction. If two pieces are cut in different directions and laid next to each other, the light will be reflected differently so that the two pieces appear to be different colors.

Fabrics that Shape Garments

Shaping fabrics are fabrics used to prevent sagging and stretching; to add crease-resistance, firmness, warmth, and body; to create design effects; to strengthen edges; to tailor a garment; or to increase garment life. Shaping fabrics must be compatible with ***fashion fabric***, the fabric from which the garment is constructed. One must select shaping fabrics carefully to achieve the intended purposes. The following guidelines should be followed in selecting shaping fabrics:

- Choose the correct fabric weight. The shaping fabric should be no heavier than the fashion fabric unless a very crisp, stand-up effect is desired.
- Select fabric of the proper finish and texture. The shaping fabric should be similar to the fashion fabric.
- Choose fabric of an appropriate stiffness and flexibility. The shaping fabric should outline the garment or should be suitable for shaping a specific detail.
- Select shaping fabric that cleans and shrinks like the fashion fabric. The amount of shrinkage and the method of care should be the same for the shaping fabric and the fashion fabric.
- Choose a color of shaping fabric that blends well with the fashion fabric. It is especially important to match the two fabrics if the fashion fabric is sheer enough that the shaping fabric shows through it.

To determine the effect of the shaping fabric on the fashion fabric, drape the fabrics together. Feel the two fabrics together to get an idea of the weight and texture. Hold the fabrics up to see how they drape together. Consider how the two fabrics will shape the silhouette and details of the garment.

Shaping fabrics are used in garments as interfacing, lining, underlining, or interlining. ***Interfacing*** is a piece of shaping fabric used to shape a garment section. It is placed between the facing and the garment to add firmness to the section and to help it retain its shape. Interfacing usually is used along garment edges, collars, and cuffs. Interfacing fabrics can be light, medium, or heavy in weight. They can be woven, nonwoven, or knitted. Some interfacing materials are fusible. ***Fusible interfacing*** can be ironed onto the fashion fabric, underlining, or garment facing. Fusible interfacing tends to add rigidity to the garment fabric. Interfacing fabrics should give support and body without dominating the garment fabric.

Lining adds shape and wear to a garment and provides a finished look inside the garment. Lining is constructed separately from the garment and is then attached to the garment. Lining fabrics are usually smooth, durable, lightweight enough that they do not interfere with the hang of the garment, and opaque enough so the inner construction of the garment will not show through. Pile fabrics, quilted fabrics, and satin-backed, insulated fabrics are sometimes used for lining in order to add warmth. The weight, color, and care of the lining fabric should be compatible with that of the fashion fabric. An anti-static finish is a desirable feature in lining fabric.

Underlining is used to add shape, crease-resistance, and wear to a garment. Each piece of the garment cut from fashion fabric matches a piece cut from underlining fabric. One piece of the garment fabric and one piece of the underlining fabric are placed together and treated as one during garment construction. Fabrics sold for underlinings can be light to medium in weight with soft, medium, or crisp finishes. Fabrics such as china silk, organdy, organza, muslin, or lightweight tricot (for knits) can be used as underlining. Underlining fabrics should be stable and lightweight. The finish (softness or crispness) of underlining fabric should be appropriate for the desired effect of the garment.

Interlining is used to add shape and warmth to coats or jackets. It is used in the body of a winter coat or jacket, and sometimes in sleeves. It is often omitted in the sleeves to reduce bulk. Interlining is cut in the shape of a lining section and is placed between the lining and the garment fabric. The interlining is constructed separately and then catch-stitched (loosely, hand stitched) to the garment facing before the lining is sewn into the garment. Example interlining fabrics are lamb's wool, felt, flannel, polyester fleece, and lightweight blanket fabric. The fabric selected for interlining should be lightweight, provide warmth, not be too bulky, and have care requirements compatible with the fabric chosen for the garment.

Estimating Yardage

Salespeople in fabric stores and departments must be aware of methods for estimating yardage. Customers often ask salespeople for help in estimating the amount of fabric needed for their sewing projects. Custom sewers must also estimate yardage. ***Yardage*** is the amount of fabric needed for a particular sewing project. Fabrics are sold in different widths ranging from 25" to 72". Since more pattern pieces can be placed on wider fabric, less yardage is needed for wider fabrics. When sewing with a pattern, it is best to use the chart on the back of the pattern envelope to estimate the amount of fabric needed. Refer to figure 7.1 for information found on the back of a pattern envelope.

Several ***views*** (illustrations) of the garment design appear on the front of each pattern envelope. Each view is slightly different. For example, one view may show the garment without sleeves while another view may illustrate the garment with long sleeves. The different views allow the sewer to be creative and adjust the garment design for his or her preferences.

To estimate required yardage, select the pattern size and view to be sewn. Then, identify the width of the selected fabric. Notice the terms "with nap" or "without nap" on the pattern envelope chart. ***With nap*** refers to any napped, shaded, pile, or one-way print. As mentioned previously, these fabrics require the pattern pieces to be laid facing in the same direction. This type of layout usually requires extra yardage. The need for extra fabric depends on the shapes of the pattern pieces. If top and bottom widths are about the same, no extra yardage is necessary. When the top and bottom widths of a pattern piece differ considerably (as in a widely flared skirt), an extra 1/4 yard of fabric should be purchased for each yard of fabric specified. When uncertain about how much yardage is needed, place the major pattern pieces on fabric that is laid on a cutting table.

To read the chart on the back of a pattern envelope, locate the fabric width and pattern view desired. Look horizontally across the chart to find the column for the correct pattern size. The amount given is the amount of fabric needed. Check to see if contrasting fabric, interfacing, lining, elastic, or trim is required for the garment view selected. If these items are required, note the width of the fabric selected and the amount required for the garment size to be sewn.

Sometimes the pattern does not specify yardage requirements for special fabrics. Some fabrics such as plaids, stripes, and diagonals must be matched at the seams during construction. Other fabrics such as large-scale prints, border prints, and lace may require special design placement. For these types of fabrics, the length of one repeat should be added for each yard of fabric required. For example, if two yards are required and the repeat is 4", 2 1/4 yards of fabric are needed.

Sometimes fabric is available in a width that is not listed on the pattern envelope chart. Usually, it is best to buy the amount shown for the width nearest to the width of the fabric selected. Some stores use a chart to estimate yardage requirements for different widths of fabrics. Yardage estimate charts do not include changes in fabric requirements caused by pattern alterations, large-scale fabric designs, directional fabrics, or garment designs with unusual shapes or large pieces. Therefore, the person making fabric purchases should estimate extra yardage to allow for these situations.

Table 7.1 is an example of a fabric width conversion chart. To use the chart, find the yardage estimate on the pattern envelope for the fabric width nearest the width of the fabric selected for the sewing project. Use that estimate as the width to locate at the top of the chart. Look down the column to find the yardage requirement given on the pattern envelope. Look horizontally across the same line to the width of fabric selected. This amount should provide enough fabric for the project. The chart only gives an estimate. If a customer has doubts about how much fabric to purchase, the customer should be encouraged to make the final decision.

Fabric Width Conversion Chart

Fabric Width Yardage	32"	35"/36"	39"	41"	44"/45"	50"	52"/54"	58"/60"
	1 7/8	1 3/4	1 1/2	1 1/2	1 3/8	1 1/4	1 1/8	1
	2 1/4	2	1 3/4	1 3/4	1 5/8	1 1/2	1 3/8	1 1/4
	2 1/2	2 1/4	2	2	1 3/4	1 5/8	1 1/2	1 3/8
	2 3/4	2 1/2	2 1/4	2 1/4	2 1/8	1 3/4	1 3/4	1 5/8
	3 1/8	2 7/8	2 1/2	2 1/2	2 1/4	2	1 7/8	1 3/4
	3 3/8	3 1/8	2 3/4	2 3/4	2 1/2	2 1/4	2	1 7/8
	3 3/4	3 3/8	3	2 7/8	2 3/4	2 3/8	2 1/4	2
	4	3 3/4	3 1/4	3 1/8	2 7/8	2 5/8	2 3/8	2 1/4
	4 3/8	4 1/4	3 1/2	3 3/8	3 1/8	2 3/4	2 5/8	2 3/8
	4 5/8	4 1/2	3 3/4	3 5/8	3 3/8	3	2 3/4	2 5/8
	5	4 3/4	4	3 7/8	3 5/8	3 1/4	2 7/8	2 3/4
	5 1/4	5	4 1/4	4 1/8	3 7/8	3 3/8	3 1/8	2 7/8

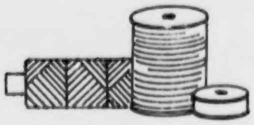
Table 7.1

SELECTION OF NOTIONS FOR APPAREL

Notions, additional items that are part of a garment besides fashion fabric, are important components of apparel. Notions include a variety of items such as thread, buttons, buckles, elastic, hooks and eyes, snaps, trims, and tape. In mass production of apparel, large quantities of notions are purchased by the manufacturer, based on the designer's specifications, for use in construction of clothing designs. In custom sewing, notions are selected to complement individual garments. In both situations, careful selection adds to the quality and appearance of each garment produced. Many of the same considerations should be used in selecting notions as in selecting fabric. Notions are also selected based on fashion trends, quality, performance, price, and suitability.

Custom sewers and salespeople who assist home sewers need experience in selecting notions for construction of apparel. It is usually best to buy all the supplies needed for a project when the pattern and fabric are purchased. This process makes it easier to match colors and speeds completion of the project. The salesperson in a fabric store or department should be familiar with the types, sizes, and locations of sewing notions.

When customers ask for assistance in selecting notions, it is best to first look at the back of the pattern envelope. Check yardage charts for items such as elastic or trim. Check the notions list for sewing supplies required for the selected pattern. Table 7.2 includes a list of various notions and sewing supplies commonly available in fabric stores and departments.

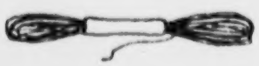


Notions and Sewing Supplies

Thread

Thread is available in sizes ranging from 8 to 100. The smaller the number, the larger the diameter of the thread.

Types	Characteristics	Uses
Basting	Loosely twisted, cotton thread	Hand basting
Button & carpet	Tough, thick cotton or cotton-wrapped polyester thread; usually has a glazed finish; size 16	Hand sewing jobs requiring very strong thread
Darning cotton	Very fine, cotton thread	Darning & mending
Elastic	Thick, very stretchy nylon or cotton-wrapped thread	Gathering or shirring on sewing machine; used on bobbin only
Embroidery floss	Cotton or rayon; six strands loosely twisted together	Embroidery; decorative handwork; strands can be separated
Extra-fine	Cotton, polyester, or cotton-wrapped polyester thread; sizes 60, 70, & 100	Lingerie; work requiring a fine thread
General purpose	Medium-thick cotton thread; available in a wide range of colors; usually mercerized; size 50	Machine & hand sewing on lightweight & medium-weight cotton, rayon, & linen; poor choice for knits or other stretchy fabrics (seams come unstitched)
	Fine, strong, silk thread; size A	Hand & machine sewing on silk & wool, knits, & tailored garments; basting all fabric types
	Fine, strong, nylon thread; size A	Hand & machine sewing on lightweight to medium-weight fabrics made of manufactured fibers
	All-purpose weight polyester thread	Hand & machine sewing on most fabrics, particularly woven fabrics made from manufactured fibers, knits, & stretch fabrics
	All-purpose weight cotton-wrapped polyester	Hand & machine sewing of knits or wovens of manufactured or natural fibers or blends



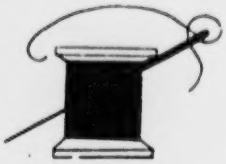
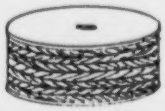


Table 7.2

Thread (continued)

Types	Characteristics	Uses
Heavy-duty	Coarse cotton, polyester, or cotton-wrapped polyester thread; size 40	Hand or machine sewing of heavy vinyl, coating, & upholstery fabrics
Metallic	Shiny thread made of nylon; available in a variety of colors	Decorative hand or machine stitching
Quilting	Glazed cotton thread; size 40	Hand or machine quilting
Silk or buttonhole twist	Coarse silk thread; size D	Topstitching; decorative hand sewing; hand-worked buttonholes; sewing on buttons; bobbin gathering thread



Straight Pins

Straight pins come in a wide range of lengths & sizes. The size of the pin refers to the diameter or width of the pin. Sizes can vary from size 8 to size 32. The larger the number of the size, the longer & wider the pin is. The pins listed below are available in a variety of sizes & lengths.

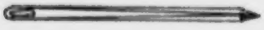
Flat head	Head of pin is flat like a nail	General use
Large head	Glass or plastic ball on one end of pin	General use; easier to see and handle
T-head	Head of pin is shaped like a "T"	Heavy pile fabrics and loose knits
Sharp point	Point of pin is sharpened for easy insertion	General use
Ballpoint	Point of pin is rounded and dull so it does not break threads of fabric upon insertion	Knits and elastic

Hand Needles

Hand needles are available in several different sizes. The smaller the number of the size, the longer & wider the needle. Sizes 7-10 are best for most clothing construction. Other sizes are used for heavy fabrics or specialized sewing.

General	Sizes range from 1 to 24 to accommodate most fabric weights	
Sharp	Sizes range from 1 to 12; medium length; rounded eyes	General sewing of all fabric weights

Table 7.2 - Continued



Hand Needles (continued)		
Types	**Characteristics**	**Uses**
Between	Sizes range from 1 to 12; short with small, rounded eyes	Heavyweight fabrics; detailed hand sewing that requires short, fine threads
Ballpoint	Sizes range from 5 to 10; rounded points	Knit fabrics
Milliner	Sizes range from 3/0 (000) to 12; long; small eyes	Basting; millinery work
Calyx-eyes	Sizes range from 4 to 8; slot for easy threading	All fabric weights
Needlecraft		Art needlecrafts
Crewels	Sizes range from 1 to 10; sharp; medium-length; long eyes	Embroidery; crewel work with embroidery
Chenilles	Sizes range from 13 to 26; sharp; heavy	Embroidery work with yarn
Beading	Sizes range from 10 to 15; long; thin; flexible	Beading; sequin work
Tapestry	Sizes range from 13 to 26; short; heavy; blunt points; large eyes	Needlepoint; tapestry work
Darning		
Cotton darners	Sizes range from 1 to 9; long; long eyes	Darning & mending with fine cotton or wool; basting
Double longs	Sizes range from 5/0 (00000) to 9; long	Darning large holes
Yarn darners	Sizes range from 14 to 18; long; heavy; large eyes	Darning with heavy or multiple yarns
Heavy-duty sewing		
Glovers	Sizes range from 3/0 (000) to 8; short; round eye; triangular point	Sewing with leather, fur, vinyl, or plastic
Sailmakers	Sizes range from 14 to 17; triangular point extending part way up the shank	Canvas; heavy leather
Curved needles	Sizes range from 1 1/2" to 3"; may be double-pointed; coarse, semicircular; oval eyes	Upholstery; braided rugs; lampshades; tasks where a straight needle is difficult to use

Table 7.2 - Continued

Machine Needles

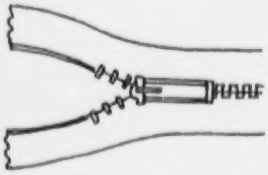
Sewing machine needles are made of steel. They are used to carry the thread through the machine while stitches are being formed. Machine needles are available in different sizes, types, & classifications. Machine needles are used for home sewing & industrial sewing.

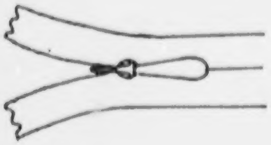
Types	Characteristics	Uses
Fine	Size 9; smallest needle	Lightweight fabrics
Medium	Sizes range from 11 to 14	General machine sewing
Heavy	Size 18; largest needle	Heavyweight fabrics
Points	Sizes range from 9 to 18	Woven fabrics
Ballpoint	Sizes range from 9 to 16	Knit & elastic fabrics
Wedge-shaped	Sizes range from 11 to 18	Leather & vinyl

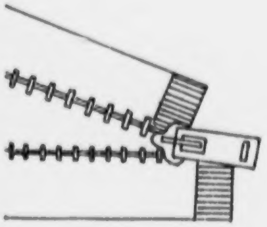
Fasteners

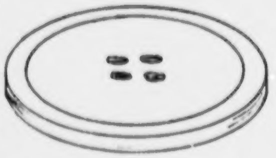
Fasteners can be used for decorative or functional purposes. When used for a functional purpose, fasteners hold sections of a garment together, in place, or closed. The type of fastener used depends on the characteristics of the garment.

Zippers		
Regular/ conventional	Exposed teeth; chain or coil; open at top; held together at bottom; many different styles & sizes	Long seams; centered, lapped, exposed, or fly methods of zipper insertion
Invisible	Hidden in seam; may require special zipper foot for particular brand; available in light to medium weights; chain or coil structure; lengths range from 7" to 22"	Skirts & dresses; anywhere conventional zippers are used except in trouser plackets
Separating	Open at both top and bottom; zipper opening separates completely; reversible or two-way	Jackets; any garment with a front opening; centered application method
Buttons		
Shank	Sizes range from 1/4" to 2"; sizes indicated by the numbers 18-80; solid top with a shank which is sewn to the garment	Thick fabric
Sew-through	Two or four holes used to sew on the button; thread shank can be added if necessary	Fabric of any weight









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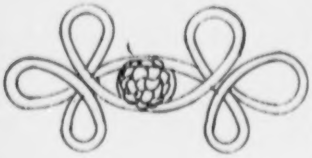
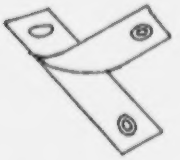
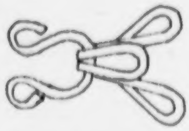
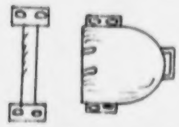
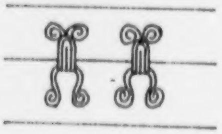










Fasteners (continued)		
Types	**Characteristics**	**Uses**
Frogs	Sizes range from 2 3/4" to 4"; made of braid with a Chinese ball button	Decorative closings
Snaps		
Regular	Sizes range from fine (4/0) to heavy (4); two-part fasteners with a ball part and a socket part which push together; nickel or black enamel finish and clear nylon	Garment parts that receive little stress; hold parts together
Covered	Sizes range from 2 to 4; heavy; neutral-colored; fabric-covered regular snaps	Garment areas where snaps will be seen
No-sew snaps	Socket & ball fasteners; held in place by pronged rings; mostly heavy sizes	Areas needing good holding power; children's clothes, sportswear, pajamas, work clothes; decorative closures
Snap tape	Regular or no-sew snaps attached to cotton or tricot tape; sold by the yard or in precut lengths	Multiple snap application
Hooks & Eyes		
Regular	Sizes range from fine (0) to heavy (3); nickel or black enamel finish; eye may be a straight bar or a loop attached to a base	Lapped edges or edges that meet
Covered	Large; neutral-colored; covered with a series of stitches that conceal the metal	Coats; jackets; garments made of deep pile fabric or fur
Waistband	Extra-large; sturdy; nickel or black finish; special design keeps hook from slipping off the straight eye	Waistbands on skirts or pants
Hook & eye tape	Neutral-colored medium hooks & loop eyes attached to cotton tape	Multiple hook & eye application; lapped or centered application

Table 7.2 - Continued

Fasteners (continued)

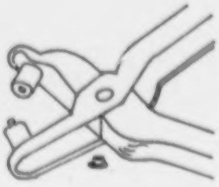
Types	Characteristics	Uses
Eyelets	Round metal reinforcements applied with special pliers; made of nickel or gilt-finished aluminum or enameled brass; sold in packages	Holes in belts & laced closures
Loop & pile fastener/ hook & loop tape	Two fasteners interlock when pressed together; one fastener has a soft, fuzzy surface & the other has small, plastic loops; available in strips, circles, squares, & other shapes of varying sizes	Garment details such as shoulder pads, cuffs, & detachable trims & collars; closures in garments made for children & physically impaired people; accessories such as belts and children's shoes; good substitute for other closures in home decorating, particularly upholstery
Buckles	Gold or silver-finished metal, plastic, bone, wood, leather, or custom-buckle kits with or without a prong in a variety of styles and widths from 1/2" to 3"; available singly or in kits with belting	Belts; decorative tabs or straps

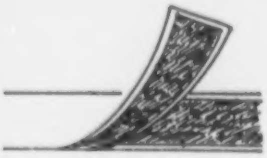
Tapes

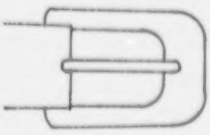
Tapes are strips of braided, woven, or knitted fabric or lace. Some tapes are functional while others are used for decoration. The function of the tape should match the function of the garment.

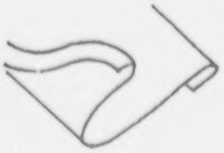
Types	Characteristics	Uses
Hem facing	Flexible tape 2" wide; available in an assortment of colors; cotton, taffeta, or decorative lace with edges folded in about 1/4"	Hem facing when garment is lengthened; eliminating bulk from hem in heavy fabric; making a casing; binding facings
Bias tape	Fabric strips of varying widths, (1/2", 1", & 1 1/4") with pre-folded edges; may be single-folded with edge folded to center, or double-folded with an additional fold just slightly off-center	Curved hems; casing; binding
Seam binding	Straight woven or lace tape in 1/2" & 3/4" widths in prepackaged lengths; needs pre-shrinking to prevent woven type from puckering	Hemming edges; woven type used to stay seams; lace type is ideal for knits

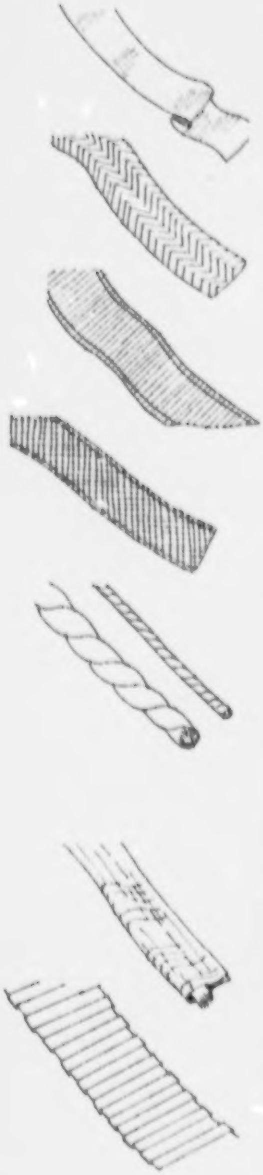
Table 7.2 – Continued











Tapes (continued)		
Types	**Characteristics**	**Uses**
Blanket binding	Acetate satin; made on the straight grain; available in 2" and 2 7/8" folded widths	Binding blanket edges
Twill tape	Woven, stable tape; made of black or white cotton twill; available in widths of 1/4", 1/2", 3/4", and 1"	Staying and strengthening seams and waistlines; tailoring
Grosgrain ribbon	Heavy silk or rayon ribbon; narrow horizontal ribs; available in various colors; widths range from 3/16" to 3 1/8"	Finishing or staying a waistline
Horsehair braid	Stiffening made from transparent nylon strands; widths range from 1/2" to 6"; may have presewn ease thread along one edge	Finishing the bottom of hems to emphasize the flare of the skirt; long evening wear
Cording	White cotton, cellulose, or synthetic cord; sold by the yard; thicknesses range from 1/16" to 1"; sizes range from 40 to 300; fine to heavy	Cording; corded buttonholes; tubing
Trims Trims are used to adorn & finish garments & accessories. Trims include items such as braids, ribbons, beads, & laces. Many different types, sizes, & colors of trims are available. Some trim types are made especially for different methods of application.		
Corded piping	Precorded 1/8" bias strip; one edge is welted; 1/4" seam allowance; available in many colors; prepackaged lengths	Piping, decorative edge trimming, decorative finish for faced edges and seams
Ribbing	Knitted, stretchy, decorative bands available in various widths and designs; available packaged or by the yard	Quick finish & color accent for neck and wrist edges; waistline insets; edgings
Lace	Openwork cloth with a design formed by a network of threads; available in various colors, widths, & types	Decorative edging; decorative inserts; gathered trim
Edging	One decorative edge & one straight edge	Decorative garment edges

Table 7.2 – Continued

Trims (continued)		
Types	**Characteristics**	**Uses**
Galloon	Two scalloped edges	Banding; border; insertion
Insertion	Two straight edges for insertion between two pieces of fabric	Sheer effect between two cut edges of fabric
Beading	Slots through which ribbon can be threaded	Decorative effects
Embroideries	Thread designs worked over a fabric base; types include blindwork, novelty, & eyelet	Decorative trims stitched by hand or machine
Appliqués	Individual motifs; embroidered thread design on a fabric base	Trimming small areas
Ribbons	Grosgrain or satin ribbon; available in varying widths, designs, & colors; sold by the yard; better quality ones are made on a jacquard loom	Trim
Medallions	Attached to form a chain; can be cut apart & used as appliqués	Decorative shapes; edging; appliqué; borders
Fold-over braid	Finished edges; folded in half; sold by the yard; available in various colors & designs	Borders; edging; outlining design; creating decorative shapes
Bands	Knitted or woven; may be prefolded; straight grain or bias; available in a wide range of widths & colors	Finishing edges; design outlines; decorative shapes
Ropes	Flexible cord; formed by twisting, braiding, or covering a cord with fabric	Trim; belts
Beads	Individual or prestrung; prepackaged beads available in several shapes & a variety of colors	Motif outlines; creating designs
Sequins	Small, shiny disks; available prepackaged in several sizes & a variety of colors	Decorative designs

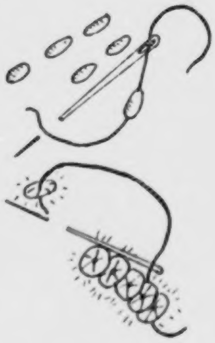
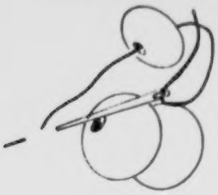


Table 7.2 - Continued



Trims (continued)

Types	Characteristics	Uses
Paillettes	Shiny, shaped spangles; larger than sequins	Ornaments on sewn projects
Pre-beaded or sequined bands	Beads or sequins attached to a series of thread chains or elastic backing	Evening looks; costumes
Glitters	Trims with shine, luster, & sparkle; may have metallic threads, sequins, beads, and paillettes	Evening looks; costumes
Shaping Aids Shaping aids are materials used to stiffen or hold the shape of certain areas of a garment. Shaping aids can be used in waistbands, hems, shoulders, & other seams in the garment.		
Waistband stiffenings	Stiff materials attached to waistbands of garments	Gives rigidity to waistlines
Belting	Cardboard-like band; 1/2" to 3" wide; regular and iron-on types available; sold by the yard or in prepackaged lengths	Belt and waistline insert
Professional waistbanding	Nonroll; heat-set stiffener	Inset for belts & waistbands in place of interfacing
Men's waistbanding	Preassembled waistband	Finishing the inside of men's trousers
Boning	Flexible nylon; usually covered with fabric; available in white or black in several widths; sold by the yard or in prepackaged strips	Maintaining & molding shape where stiffness is required
Stays	Metal, plastic, or bone strips in precut widths & lengths	Shaping; molding; vertical reinforcement
Weights	Sizes range from 3/4" to 1 1/8"; available in a variety of metals	Controlling drape of fabric
Lead pellet/ lead disk	Strips of lead pellets or square or round disks; pellets are sold by the yard; pellets may be covered with fabric; disks come in different sizes	Controlling drape of fabric; preventing a hem area from shifting

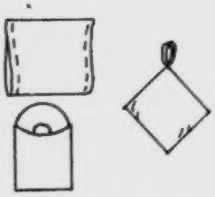
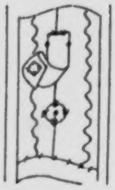


Table 7.2 – Continued

Shaping Aids (continued)		
Types	**Characteristics**	**Uses**
Chain	A chain available in different weights & lengths; provide decorative weighting	Controlling drape of fabric; obtaining a uniformly weighted hem
Lingerie strap holders	Ends snap together; available in a variety of colors	Holding lingerie straps on the shoulder to prevent showing or slipping
Shoulder pads	Available in dress or coat styles; covered or uncovered; sizes, shapes, & thicknesses dictated by fashion	Padding shoulders of garments; correcting figure faults
Bra pads	Shaped, padded cups; available in several sizes	Evening wear; swimwear
Elastics Elastic is a rubber-core yarn covered with cotton fibers, manufactured fibers, or a blend of fibers. It is available in a variety of colors & can be round or flat, ranging in widths from 1/4" to 1 1/4". Elastic is sold by the yard or in prepackaged lengths.		
Woven	Has less gripping power than braided; does not narrow when stretched	Good for stitching on edges
Braided	Narrows when stretched; used in casings; greater gripping power than woven	Used in casings for waistbands & other tight-fitting areas
Fusibles Fusibles are functional or decorative items that adhere to fabric when heated. Heat causes the fusible material to soften & adhere to fabric. Fusible material can be used on appliqués, patches, hem tape, & zippers.		
Patch iron-ons	Adhesive-backed fabrics; pressed onto the garment fabric; available in many forms for many purposes	Mending, repairing, or strengthening stress areas; decorative effects
Fusible web	Sold by the yard or in precut lengths; bonding agent that is melted between two layers of fabric	Joining two layers of fabric; hems; facings; appliqués; trims



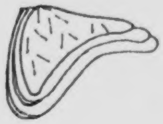


Table 7.2 – Continued

Points to Remember

- Fabrics and notions are important components of garments. Fabrics and notions are chosen based on fashion trends, quality, performance, price, and suitability.
- Fabrication involves selecting or creating an appropriate garment style for a fabric or selecting the right fabric for a garment design. Fashion designers, custom sewers, and salespeople must have a knowledge of fabrics and notions that are suitable for use with different garment designs.
- It is important to check the grain of woven fabric before purchasing it. Grain is the direction of a weave in a fabric. If the warp and filling yarns intersect at right angles, the fabric is on-grain. If the yarns are not at right angles, the fabric is off-grain. Use of off-grain fabrics causes various construction problems.
- The weight of a fabric is the heaviness or lightness and thinness or thickness of the fabric. Hand is the feel, body, and the way the fabric falls when draped. Both the weight and hand of a fabric influence the silhouette of a garment constructed from that fabric.
- Fabric weights are measured in ounces per yard, yards per pound, and ounces per square yard. Fabrics are grouped into different categories according to weight. Fabrics of different weights are appropriate for use in constructing specific types of garments. Different fabric weights are also chosen for different seasons of the year.
- Fabrics are constructed in a variety of colors, patterns, and prints. Select fabrics with prints that are scaled appropriately to complement the design of the garment. Large prints should be used with simple designs. Small prints and solid colors may be used with garments that have more design details.
- Napped, sueded, and pile fabrics have nap and usually require more yardage than other fabrics. Nap is created on fabric by rubbing the surface of the fabric with a rough instrument. In some cases, the fabrics are then brushed so that the nap runs in one direction. Therefore, all pattern pieces must be laid facing one direction when constructing garments from these fabrics.
- Shaping fabrics are used in addition to fashion fabric for construction of some garments. Shaping fabrics are used for interfacing, lining, underlining, and interlining.
- Yardage is the amount of fabric needed for a particular sewing project. Fabrics are sold in different widths. Less yardage is needed for wide fabrics than for narrow fabrics. Refer to information on the pattern envelope and to fabric width conversion charts for assistance in estimating yardage. Extra yardage is usually required for napped fabrics, plaids, one-way prints, stripes, and diagonals.
- Notions includes items such as thread, buttons, elastic, hooks and eyes, snaps, trims, and tape. Careful selection of notions adds to the quality and appearance of each garment.

Words to Know

border print
bottom-weight fabrics
fabrication
fabric performance
fashion fabric
fusible interfacing
gigging
one-way print
ounces per square yard
ounces per yard
pile fabrics
raising
relatively lightweight fabrics
repeat

grain
hand
heavyweight fabrics
interfacing
interlining
lining
medium-weight fabrics
motif
nap
napped fabrics
notions
shaping fabrics
sueded fabrics
top-weight fabrics
two-way prints
underlining
very heavyweight fabrics
views
weight
with nap
yardage
yards per pound

Questions for Review

1. Is it best to select the fabric before designing a garment or design a garment after selecting fabric? Why?
2. What is the difference between fabric that is on-grain and fabric that is off-grain? Why should off-grain fabric be avoided?
3. How is the grain of fabric checked?
4. How do the weight and hand of fabrics influence their performance?
5. What different measurements are used to indicate the weight of fabrics?
6. What categories are used to group fabrics by weight?
7. What should be considered when selecting fabric that is patterned or printed?
8. How are napped, sueded, and pile fabrics made? What should be considered when purchasing napped, sueded, or pile fabrics to construct a garment?
9. Why are shaping fabrics added to some garments? In what different ways are shaping fabrics used?
10. How should a salesperson assist a customer in estimating yardage for a garment he or she wishes to construct?
11. What are examples of notions used in apparel construction?

8

Elements and Principles of Design

ESSENTIAL ELEMENT

- Apply design elements when designing, constructing, or altering apparel.(q3B and q6A)

OBJECTIVES TO ACHIEVE

- Suggest ways the elements of design may be used to design, construct, or alter apparel.
- Analyze the use of the principles of design in apparel design, construction, and alteration.

Design refers to the organization or arrangement of parts that make up a structure or work of art. People react to design each day. Design appears in various surroundings such as homes, buildings, furnishings, and clothing. Poor design causes negative reactions from people. Poorly designed items are usually considered to be confusing, out-of-place, or unattractive. People usually react positively to good design. Good design does not happen by accident. Good design is planned and results from combining various elements and principles in an appropriate manner.

Design influences the clothes we buy and the fabrics we select. It is important for employees in the textiles and apparel industries to be able to recognize and apply good design. People are not born with good taste. Good taste involves knowing how to combine elements and principles of design according to current fashion trends in order to develop a pleasing arrangement of parts.

One can develop good taste by learning the parts that make a good design. The parts of a design are called the ***elements of design***. The elements are line, shape/form, space, texture, and color. These concepts are used by fabric and fashion designers. The elements and principles of design also influence the construction and alteration of garments. Knowledge of the elements and principles of design is used in describing fabrics and fashions to customers, in developing fashion displays, and in planning promotional events such as fashion shows.

ELEMENTS OF DESIGN

The end result of a design should be a visual process. The elements of design used in apparel should be flexible. They are meant to be interpreted within the current fashion styles and trends or to enable the designer to solve a particular problem. Designers use the elements of design to create optical illusions. The elements of design are the ingredients a designer works with in creating any design. After a design is created, the elements of design influence the procedures used to construct and alter the garment.

Line

Line is the element of design that indicates direction, length, width, and straightness. All lines in design are either straight or curved. Usually straight and curved lines are combined in any design. Lines are found in the structure of each garment as well as in the design of fabric used to construct the garment. A line is versatile and can define or limit shape and suggest movement, speed, or direction. A line leads one's gaze from one end of the line to the other. Each type of line creates a different mood or effect. The four types of lines are vertical, horizontal, diagonal, and curved. Different combinations of these lines can provide a variety of design possibilities. Figure 8.1 shows these four types of lines found in design.

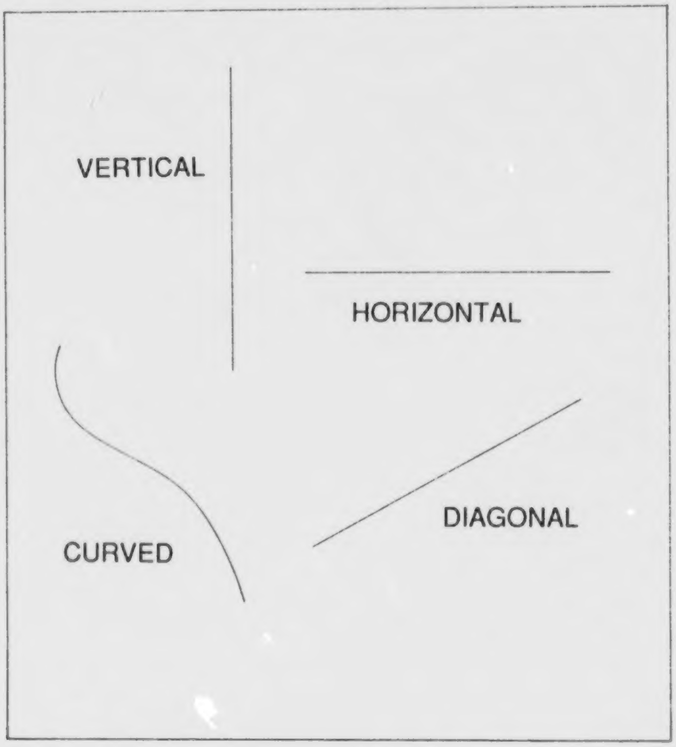


Figure 8.1

Straight lines give a feeling of strength and severity. Direction in line can be vertical, horizontal, or diagonal. ***Vertical lines*** are those lines that go up and down. Vertical lines are the strongest type of line and give an impression of dignity, discipline, and strength. Vertical lines suggest height. Broad, vertical lines create width. In general, vertical lines suggest stability.

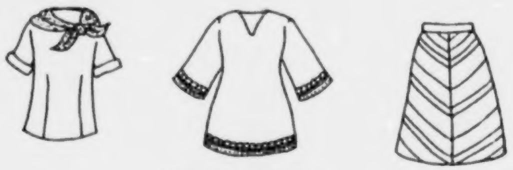
Horizontal lines are those that go from side to side or are parallel to the ground. Horizontal lines are not as strong as vertical lines and create a sense of rest. These lines suggest serenity, repose, and relaxation. Horizontal lines may be used to relieve or decrease the effects of strong vertical lines. Horizontal lines usually make the figure appear broader. A horizontal line placed high on the body may make the figure appear taller.

Diagonal lines are lines that are neither horizontal or vertical, but slanted. These lines break the monotony of vertical and horizontal lines by expressing excitement and movement. They are more difficult to use successfully. Diagonal lines tend to point into space and unless they are decisively stopped, can keep the eye moving right off the garment. The herringbone pattern is an example of a well-controlled diagonal line. The lines meet to form Vs giving a sense of completion and restfulness.

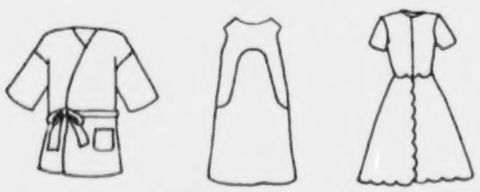
Curved lines suggest grace, youth, and subtle motion. They are lively, more fun than straight lines, and typically add softness to a design. Using too many curved lines in a garment may create a restless feeling. This effect can be corrected by strengthening the straight lines, eliminating some of the curved ones, or doing both. A garment that appears too stiff from too many straight lines can be softened by the use of curved lines. Vertical, horizontal, and diagonal lines are typically straight lines. Curved lines can also be used to show direction. Wavy lines that are arranged in a certain design can appear to have a horizontal direction just as a straight line arranged in a similar manner.

The width of lines in a design can vary greatly and give different effects. A narrow line will give a different effect than that of a wide line even though the lines may have the same direction. The lengths of lines can also vary greatly and give different effects. The appearance of several short lines differs greatly from the appearance of one long or several long lines.

Lines in clothing help give garments shape. These garment lines can be structural, decorative, or both. ***Structural lines***, sometimes called ***construction lines***, are the basic lines of a garment such as the yokes, seamlines, pockets, necklines, pleating, and sleeves. These lines may be horizontal, vertical, diagonal, or curved. Structural lines are most noticeable in garments of solid colored fabric. ***Decorative lines*** are those lines present in the fabric design or construction and can be added by applying trim, accessories, and stitching. Decorative lines give a garment individuality. Figure 8.2 shows examples of structural and decorative lines in garments.



Decorative Lines



Structural Lines

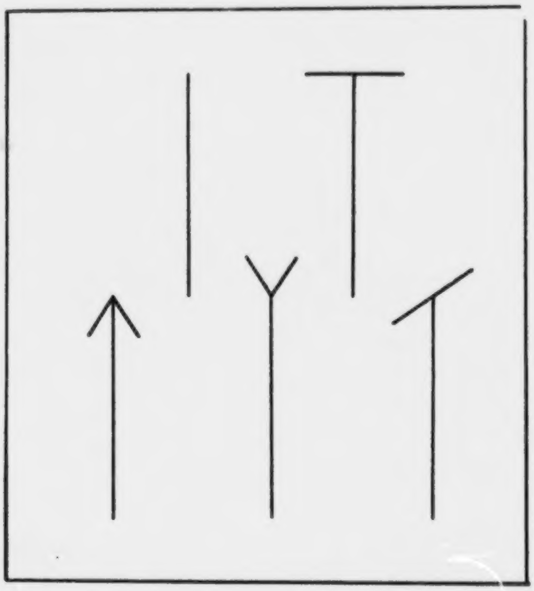
Figure 8.2

If a garment is made from a solid colored fabric or a fabric with a very simple design, structural lines will be the most noticeable lines in the garment. Decorative lines are much more noticeable in a garment than the lines created by using stripes or plaid fabrics. Decorative lines can also accent structural lines through repetition and contrast and can be created to accent large areas through smocking, shirring, appliqué, and pin tucks.

The following guidelines may be used to design, select, construct, and alter apparel that will compliment each customer's figure:

- A garment with a centered vertical line adds height and slims the figure.
- A series of vertical parallel lines, such as stripes or pleats, force the eye to travel around the figure. These lines add height and width to the figure. The closer the parallel lines are, the less wide the figure appears to be.
- An asymmetrical or off-centered vertical line adds height and cuts the weight of the figure.
- A T-line, a vertical line cut by a horizontal line, adds less height than a single vertical line; the T-line also adds width at the shoulders and causes the waist and hips to look smaller. It is a good choice for a tall person.
- An arrow line adds height and narrows the shoulders. It is a good choice for a short, broad-shouldered person.
- A Y-line adds height and width to narrow shoulders and looks attractive on full figures.
- Diagonal lines do not change the figure's height and width, but do add interest and eye appeal and slenderize the figure. Diagonal lines look attractive on all but the very thin person.
- Horizontal lines make any figure appear shorter and heavier. The lower the horizontal line, the shorter the person looks. A low horizontal line, produced by wearing a long tunic or three-quarter-length coat may make a short person look dumpy and a tall person look more attractive.

These guidelines provide examples of how the interaction of various types of lines result in different effects on garments. Figure 8.3 illustrates how several vertical lines of the same length look different when other types of lines interact with them.



Each vertical line is exactly the same length, but the lengths do not look the same.

Figure 8.3

Shape/Form

Lines are combined to create and define shape or form. The lines in a garment can represent anything from a geometric shape to an object. The basic shapes formed by lines are the square, rectangle, triangle, and the circle. These can be combined to create a variety of more complex shapes. The types of lines combined in creating a shape determine the feeling conveyed by that shape. Curved lines form circles, ovals, and ellipses while straight lines create squares, rectangles, and triangles.

The proportion of these forms or shapes is an important factor in design. Squares and rectangles produce a feeling of mathematical precision while circles and ovals convey a feeling of completeness. If there is no pattern to an arrangement of forms, the effect may be jumpy. Shapes and forms that are related to each other complement each other. A form can also give an impression of lightness or heaviness. This impression depends on the fabric, especially the texture of the fabric, from which the garment is made. A certain amount of diversity of forms is desirable as long as the different forms are harmonious.

Shape or ***form*** includes the silhouette formed by the outline of a clothing design. The silhouette is often considered the most important design line in clothing. As defined previously, the silhouette is the outline or overall shape of a garment. The silhouette encloses all other lines of a garment. The three classic silhouettes are bell, tubular, and back fullness. There have been variations of hem lengths, positions of waistlines, and styles of clothing, but certain basic shapes have remained the same.

The ***bell silhouette*** is characterized by a fitted waist and full skirt or pant leg. Capes and full skirts are examples of this silhouette type. The ***back fullness silhouette*** or bustle is characterized by fullness in the back but not in the front of the garment. Fabric is occasionally draped at the back hipline to give fullness. Suit jackets often flare in the back. The ***tubular silhouette*** is characterized by a slim skirt. It may have a low or high waistline. It is often left unbelted hanging straight from the shoulders to the hem. Each individual should select garment silhouettes that compliment his or her body shape. Figure 8.4 includes examples of the three classic silhouettes.

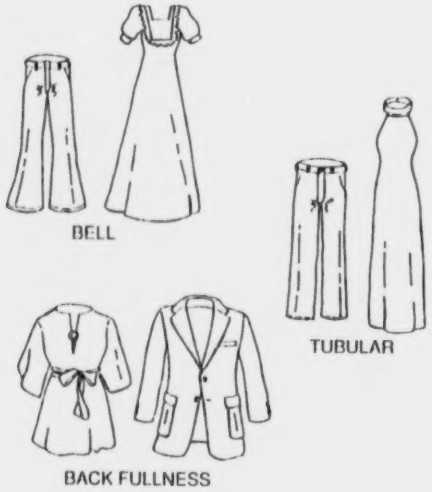


Figure 8.4

The shape that is desirable for others to see can be created through illusions in silhouette. To do this, first select an attractive silhouette. Body proportions can be emphasized or not emphasized by the outline of a garment. How tall someone appears to others is affected by the silhouette created. If looking taller is the goal, choose a slim silhouette with distinctive vertical lines so that the height is emphasized through repetition of the vertical lines in an individual's figure. By contrast, the silhouette appears shorter and wider with horizontal body lines.

Space

Space is the background against which forms or shapes are seen. A space may be used to emphasize or camouflage physical characteristics. Space provides a relief from looking at a particular motif on a clothing design.

The space between patterns on a garment can help create an illusion of size. For example, a widely spaced print fabric may appear more like a solid fabric than a print with closely spaced patterns. The two prints create different illusions of body size. Pleasing space divisions will make a garment more attractive while poor use of space will detract from the overall appearance.

Texture

Texture is the surface quality of an object. Texture is a design element that can be felt as well as seen. Every fabric has its own texture whether it is rough, smooth, shiny, soft, or harsh. Texture is an important consideration in determining how a fabric should be used. Feeling an article is often as important as seeing it. Texture can be determined more accurately through touch than through sight. One imagines how an article feels by looking at it. Because appearance can be misleading, both touch and sight are used to identify the true texture of an object.

Today, fabrics are available in many different textures and a variety of designs or patterns. The fiber(s) used to make fabrics influence the textures of the fabrics. Silk fibers may give fabric a smooth, shiny texture. The methods used to construct fabrics also affect their textures. Variations in weaving and knitting can create ridges in fabric or make them smooth, fuzzy, or shiny. Fabric finishes also affect the textures of fabrics by making them soft, smooth, shiny, crisp, or by giving them other characteristics. Rough and dull textures are usually used to create informal or casual garments. Smooth or fine textures usually suggest formality or elegance.

Texture greatly affects the appearance of color. Fabrics of different textures such as tweed and satin that are dyed an identical color may not appear to be the same color. A rough fabric such as tweed will absorb light. The fabric's unevenness creates shadows making it appear darker than a satin which is smooth and reflective. These factors are important to consider when trying to match colors in different textures.

As with line, fabric texture affects a person's appearance. Thick, shaggy, fuzzy, or wrinkled textures seem to add to body size because bulkiness is created. Sleek, glossy, or shiny textures tend to increase apparent body size because a shiny surface reflects more light than a dull surface. In contrast, smooth, dull textures seem to decrease body size because these textures reflect less light than glossy textures.

The age and personality of the wearer, the size and shape of the figure, the design of a garment, and the use and care of fabric all determine the choice of texture for a garment. Fashion designers, salespeople, and custom sewers must all be familiar with the effects that textiles have on a person's appearance in order to design or to assist customers in making good clothing choices.

Glossy textures, as seen in satin fabric, emphasize figure defects and a poor complexion. A heavy person may choose to avoid clothing that is made from fabrics such as satin. In addition, satin is likely to overpower the small, slender figure. Heavy or bulky textures are suitable for the person with an average figure and height. Heavy, bulky textures overpower the small, slender figure and add bulk to the short, heavy figure. Bulky textures are best for use in making garments with designs having few seams, for sportswear, and for men's and women's coats.

Stiff textures tend to stand out from the figure. Some styles that use stiff textures may conceal large thighs and hips if the figure is otherwise well-proportioned. Stiff textures as seen in taffeta fabric are better for slim, youthful figures than for older or heavy figure types. Sheer textures such as voile and chiffon fabrics cling and reveal the figure. They are not as revealing if they are used over taffeta linings. Sheer fabrics are most frequently used to construct women's apparel such as full skirts, draped blouses, and draped skirts. Smooth soft textures such as crepes and wool fabrics, manufactured fibers, soft linen, percale, poplin, and silk are suitable for almost any figure type.

There are a few set rules and regulations for combining textures. Generally, textures combined in a design should be related or should contrast pleasantly. Textures that can be combined successfully are considered to be natural companions whereas other textures, such as denim and chiffon, seem to clash. The combined textures should express harmony by being suited to each other and to their intended uses. Practice in combining textures and observing textures that go well together will help the understanding of and use of the element of texture. One helpful guideline is that usually no more than two textures should be combined in a single garment.

Color

A person with normal vision can discriminate at least 2,000 colors. ***Color*** is one of the most important elements in apparel design because of the effects it has on people, garments, and accessories. People react emotionally and physically to the colors around them. Colors can be irritating, disturbing, restful, soothing, stimulating, or exciting.

Color is the aspect of clothing that is most often noted and remembered, followed by shape/form. The color and form of a garment interact together. This interaction between colors and forms is visual. The visual perception of a garment is an evaluation of what the observer's eyes record. The designer influences the observer's reaction, impression, and satisfaction by the forms and colors selected for a garment.

A person enjoys the element of color immediately upon seeing a garment. Use of color can emphasize an area of the body or draw attention away from it. Contrasting colors can emphasize an area while related colors can hide the area. No one color is ever completely isolated from all others.

A color wheel is helpful in selecting and coordinating colors. The ***color wheel*** is a diagram used to show characteristics of colors, to create different colors, and to develop color schemes or color plans. Primary, secondary, and tertiary are names given to the colors on the most common color wheel that includes twelve colors. The basic color wheel can be expanded to twenty-four colors showing the primary, secondary, intermediate, and the quaternary colors. Colors in a color wheel are arranged in a circle to show how they relate to each other. The ***primary colors*** are red, yellow, and blue. These three colors cannot be made by mixing other colors together. ***Secondary colors*** are made by mixing equal parts of any two primary colors. The secondary colors are violet, green, and orange. Figure 8.5 shows a basic color wheel including twelve colors.

Basic Color Wheel

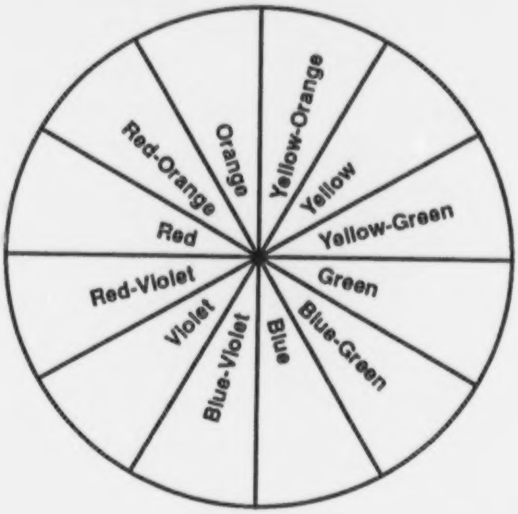


Figure 8.5

The ***tertiary colors*** or ***intermediate colors*** are those between the secondary and primary colors on the color wheel. The intermediate colors play an essential role in color harmonies. Designers and artists use more intermediate colors and other color mixtures than the primary and secondary colors. Each intermediate color is made by mixing one primary color and one secondary color that are next to each other on the color wheel. The name of the tertiary color includes both the primary and secondary color names with the primary name stated first. Names of the tertiary colors are yellow-green, blue-green, blue-violet, red-violet, red-orange, and yellow-orange. The ***quaternary colors*** are formed by mixing primary and intermediate or intermediate and secondary colors.

Color has three descriptive properties called hue, value, and intensity. ***Hue*** refers to the basic color identity or the specific name of a color such as red, blue, or green. Each color on the color wheel is a hue. The term hue does not imply color purity. The same hue may have many different commercial names. The colors such as Terra Cotta, Cobalt Blue, Persimmon, and Emerald Green are commercial names of colors. New color names are introduced every season in the fashion industry. These names change with fashion seasons but are used to refer to standards on the color wheel that never change.

Value refers to the lightness or darkness of a color in relation to black and white. Value of a color depends on the amount of light the color reflects. The basic hue or middle value of a color is what appears on the color wheel. When white is added to a color, the result is a ***tint***. A ***shade*** results when black is added to a color. When white is mixed with a color, the color is lightened by making it more reflective. Adding black will darken a color's value by making it less reflective. ***Tones*** are formed by adding both black and white to a hue. A tone can also be formed by adding some of the color's direct complement.

Intensity refers to the degree of brightness, dullness, strength, or weakness of a color. Intensity describes the degree of purity or strength of a color. Intense colors are bright and clear and are stimulating. They make objects appear larger and closer. They also call attention to form. Less intense colors are dull and grayed. They create a calmer effect than intense colors. Less intense colors make objects seem small and far away. In combining colors, one should consider the hue, value, and intensity of the colors used in a color combination. Any colors can be combined with pleasing results if they are of the right value and intensity.

When two or more colors are combined they can be classified as similar or related color harmonies and contrasting color harmonies. Similar color harmonies include monochromatic and analogous color schemes. Contrasting color harmonies include accented-neutral, complementary, split complementary, and triad color schemes. Figure 8.6 shows illustrations of several basic color schemes.

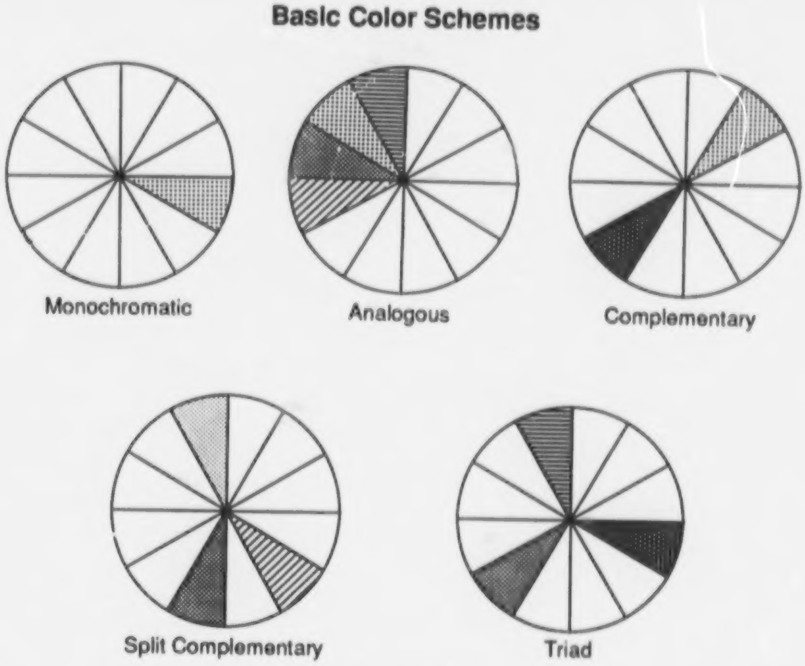


Figure 8.6

A ***monochromatic*** color scheme contains two or more variations of the same hue. It includes various tints, shades, and intensities of one color. Unity is a characteristic of a monochromatic scheme.

An ***analogous*** color scheme involves use of colors that are adjacent on the color wheel. There should not be fewer than three or more than six colors in this scheme. Analogous color schemes usually look best when one color is dominant and the other colors are used in smaller amounts to add interest.

Complementary color schemes involve use of colors that are direct opposites of each other on the color wheel. Red and green are examples of complementary colors. Complementary colors make each other look more intense and brighter when used together. Generally, one color is dominate and various values and intensities are used to lessen the contrast.

A ***split complementary*** color scheme uses one color with the two colors on either side of its direct complement. Orange, blue-green, and blue-violet is one example of a split complementary color scheme. Split complementary color schemes are often used in plaid fabrics. A ***double complementary*** color scheme uses two complementary schemes together. Any combination of pairs may be used as long as each is composed of complementary colors. An example is the combination of yellow, violet, green, and red.

Triad color schemes involve the use of hues that are four steps apart and equidistant from each other on the color wheel. Red, yellow, and blue form a triad color scheme. ***Accented neutral*** color schemes are made by using black, white, or gray with a small amount of a bright color accent. A white dress with a red belt shows an example of an accented neutral color scheme.

The psychological effect of color is an important consideration in color selection. Moods and personalities are reflected and influenced by the use of color. In addition, color is important in complementing positive body characteristics and minimizing negative traits. ***Cool colors*** include blue, green, and purple. They are associated with grass, trees, and water. Cool colors give a feeling of restfulness. They are also known as the receding colors. Dark, cool colors tend to make a figure look smaller.

Warm colors include red, yellow, and orange. They are associated with warm objects such as fire and the sun and give a feeling of activity and movement. The warm colors are also known as advancing colors because they can make objects appear closer or larger than they really are. Warm colors, especially when used in strong intensities, make a person appear larger.

Brilliant color contrasts result when certain hues are used with any of the primary neutrals. The ***primary neutrals*** are white, gray, and black. White provides the purest contrast of the neutrals. White is the absence of all color. Any color that is presented against white stands out with color purity. Black represents the presence of all color and delivers the greatest mood of the neutrals. Neutral colors tend to conceal body contour and slim the figure. Grays and other medium hues make a figure blend into the background.

PRINCIPLES OF DESIGN

The parts that make up a design are called the elements of design. There are no rigid rules for combining the elements to create a design, but there are basic guidelines to follow. These guidelines are called the ***principles of design***. They are balance, proportion, rhythm, emphasis, and harmony/unity. In good design, it is almost impossible to separate the elements and principles of design because they work together to create a total effect. The elements are the building blocks of design while the principles are the guidelines for combining the elements.

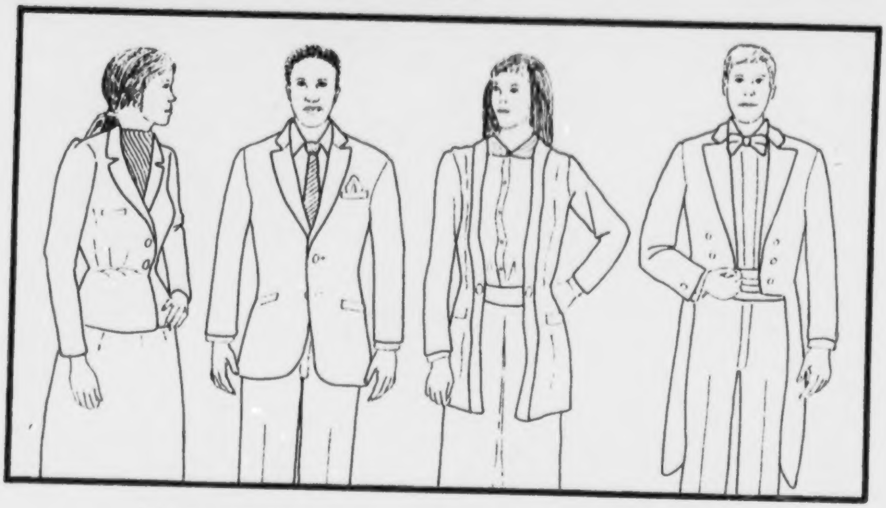
Balance

Balance is the principle of design that produces a sense of equality between opposite elements and of restfulness. The elements in a balanced design appear to be equally distributed on both sides of a central focal point. A balanced design produces composure because both sides have an equal pull on the observer's eyes. A design that is not balanced appears disturbing and unpleasant.

Each element and object in a design must contribute to creating balance. Color, form, texture, pattern, and lighting are examples of factors that produce balance. Balance, in turn, helps to create unity in a design. The two types of balance are formal and informal. Both types of balance can create pleasing designs. Formal and informal balance produce very different effects.

Formal balance or ***symmetrical balance*** exists when a design is exactly the same on both sides of the design center. An example is a jacket with buttons down each side of the center and pockets of the same size and in the same place on both sides of the center. Formal balance gives an orderly feeling to a garment.

Informal balance or ***asymmetrical balance*** is achieved by placing different, but equivalent, designs on either side of a central point. In other words, the design is visually balanced but is different on each side of the design center. An example of informal balance is a jacket with a side closing and one pocket. Arrangement of informal balance usually requires more thought and creativity than does creating a design using formal balance. Figure 8.7 shows four garments designed using formal and informal balance.



Informal Balance Formal Balance

Figure 8.7

Proportion

Proportion refers to the relationship of parts to each other and to the whole based on the way space is divided. All space divisions should be pleasingly related to each another and to the design as a whole. All parts of the design look good together. Generally, uneven space divisions are more interesting than spaces divided equally.

The law of proportion, when applied to the size relations of objects used together, is called ***scale***. The terms scale and proportion are similar, and proportion cannot be discussed without referring to scale. Proportion deals with space relationships while scale refers to size relationships. Clothing should simulate ideal body proportions. For example, a long-waisted person may wish to choose garments that are not fitted at the waistline.

In fashion design, the principle of proportion can be understood by considering the length of a jacket in relation to the length of a pair of men's slacks or to a woman's skirt. Often, people shorten slacks or a skirt that is/are part of a suit without shortening the jacket. In some cases, the jacket may look out of proportion because the relationship of the parts to the whole has been changed. Shortening the jacket as well as the slacks usually returns proper proportion to the fashion.

Rhythm

Rhythm refers to the illusion of motion as the eye moves easily from one part of the design to another. Rhythm provides a sense of order and a quality of gracefulness. Connected, controlled movement creates rhythm.

Repetition may be used to create rhythm through repeating objects, colors, or fabrics in a design. For example, colors present in fabrics may be selected and repeated in accessories. In the structure of a garment, repetition of shapes may be used in several ways. Decorative stitching or trims may repeat some of the construction or structural lines. For example, the yoke of a man's western shirt may have decorative fringe or studded stars to add rhythm through repetition.

Rhythm created by ***gradation***, also called ***progression***, is accomplished by making gradual, successive changes in a design. Gradation or progression involves a series of similar objects ranging from small to large, large to small, thick to thin, or thin to thick. A variation in sizes of circles or thick and thin lines is an example of gradation or progression in design. Gradation may also be found in structural lines. A formal women's garment with many ruffles may have ruffles at varied widths to give a sense of rhythm to the garment.

Rhythm by ***transition*** is achieved through the use of continuous lines moving throughout a design. A continuous line causes the observer's eyes to move along the design in a rhythmical manner. Rhythm of line can enhance a garment or destroy the positive aspects of the garment. Unless breaking the rhythm is a carefully planned part of the design, such as a pocket with horizontal strips on a jacket with vertical stripes, interrupting rhythm can be upsetting to the eye.

Emphasis

Emphasis is created when attention is drawn to a certain part of a design. The center of interest dominates the design. It can be created by contrast in texture, color, and line or by use of unusual shapes, textures, and colors. A contrasting belt can be used to emphasize a small waist or jewelry can be used to emphasize hands and arms. Placement of buttons, contrasting trims, and monograms may be used for emphasis.

Repetition, as well as contrast, can create emphasis. A neckline that repeats the shape of the face will accent the face. A strong color in a print may be emphasized by repeating the color in a belt or scarf. Lines in a particular garment may become dominant if they are outlined with stitching or a decorative trim.

Typically, garments are designed with only one main focal point. When too many different textures, lines, or colors are presented, a design may have a cluttered look. In addition, emphasis in fashion design can be used to draw attention to a feature or to distract from a feature. If a person wishes to appear taller, a garment may be selected that has a focal point high on the body. This technique will draw the observer's eyes upward and give the illusion of height.

Harmony/Unity

Achieving ***harmony*** or ***unity*** is the final goal of any design. It is created when all parts of the garment fit together to create a pleasing, whole design. The garment and the body must appear to be well-suited for each other. Each part should help fulfill the design's purpose and add to its appearance.

Having a logical and orderly plan helps to achieve unity. The clothing design must have a center of interest that determines the overall character of the design. There must be sufficient emphasis on the center of interest in order to make its role as the center obvious. Repetition is also an integral part of a unified design.

Sizes, shapes, colors, textures, and ideas used to create a design must be related for unity to exist. Unity is necessary to create an integrated whole. Too much unity can cause monotony. A certain amount of variety is needed to create interest. Too much variety can cause disorder and destroy the unity of the design. Harmony results from a tasteful blending of balance, rhythm, emphasis, and proportion to produce a unified but interesting whole.

Points to Remember

- Design refers to the organization or arrangement of parts that make up a structure or work of art.
- The elements of design are line, shape/form, space, texture, and color. The use of these elements in designing apparel should be flexible. They are meant to be interpreted within the current fashion trends and to enable the designer to solve a particular problem.
- Line is the element of design that indicates direction, length, width, and straightness. Lines are vertical, horizontal, diagonal, and curved. Lines may be structural (construction) or decorative.
- Lines are combined to create and define shape or form. Shape or form includes the silhouette formed by the outline of a clothing design. The three classic silhouettes are bell, tubular, and back fullness.
- Space is the background against which forms or shapes are seen. A space may be used to emphasize or camouflage physical characteristics.
- Texture is the surface quality of an object. Every fabric has its own texture whether it is rough, smooth, shiny, soft, or harsh. Texture is an important consideration in determining how a fabric should be used.
- Color is the aspect of clothing that is most often noted and remembered, followed by shape and form. The color and form of a garment interact together.
- One must consider the hues, values, and intensities of the colors used in a color combination. A color wheel is used to show characteristics of colors, to create different colors, and to develop color schemes or color plans.
- Primary, secondary, tertiary or intermediate, and quaternary colors are categories in which colors are grouped depending upon where they are on the color wheel.
- The parts that make up a design are called the elements of design. There are no rigid rules for combining the elements to create a design, but there are basic guidelines to follow. These guidelines are called the principles of design.
- The principles of design are balance, proportion, rhythm, emphasis, and harmony/unity.
- Balance is the principle of design that produces a sense of equilibrium between opposite elements and of restfulness.
- Proportion refers to the relationship of parts to each other and to the whole based on the way space is divided.
- Rhythm refers to the illusion of motion as the eye moves easily from one part of the design to another. Rhythm can be created by repetition, gradation or progression, and transition.
- Emphasis is created when attention is drawn to a certain part of a design.
- Harmony or unity is the final goal of any design. Harmony results from a tasteful blending of balance, rhythm, emphasis, and proportion to produce a unified but interesting whole.

Words to Know

accented neutral
analogous
asymmetrical balance
back fullness silhouette
balance
bell silhouette
color
color wheel
complementary
construction lines
cool colors
curved lines
decorative lines
design
diagonal lines
double complementary
elements of design
emphasis
form
formal balance
gradation
harmony
horizontal lines
hue
informal balance
intensity
intermediate colors
line
monochromatic
primary colors
primary neutrals
principles of design
progression
proportion
quaternary colors
repetition
rhythm
scale
secondary colors
shade
shape
split complementary
structural lines
symmetrical balance
tertiary colors
texture
tint
tones
transition
triad
tubular silhouette
unity
value
vertical lines
warm colors

Questions for Review

1. What are the four types of lines? What different effects are produced by using each of these types of lines?
2. How are structural and decorative lines different?
3. What is a silhouette? How are the basic silhouette types used to produce different effects and designs?
4. How does texture affect the color of a fabric? What are examples of different textures?
5. Which two elements of design are most often noted and remembered in regard to clothing?
6. How does understanding the color wheel benefit a person employed in the textiles and apparel industries?
7. What are the differences between values, shades, and tones?
8. What are examples of monochromatic, analogous, split complimentary, double complimentary, and triad color schemes?
9. If the elements of design are the building blocks of design, what are the principles of design?
10. What are examples of the use of formal balance? informal balance?
11. How does proportion differ from scale?
12. What methods are used to create rhythm in a design?

9

Sewing, Repairing, and Pressing Techniques

ESSENTIAL ELEMENTS

- Apply appropriate sewing and pressing techniques in garment construction.(q3C)
- Demonstrate appropriate garment repair techniques.(q5C & q9C)
- Demonstrate sewing, repairing, or pressing techniques.(q8C)

OBJECTIVES TO ACHIEVE

- Explain how the principles of managing time, energy, motions, and work can be applied to sewing, repairing, and pressing tasks.
- Describe the major steps involved in the sewing process.
- Apply sewing techniques including basic stitching methods; methods for sewing corners, curves, points, and inserts; and methods for producing darts, pleats, tucks, and buttonholes.
- Identify methods for producing various types of seams and seam finishes.
- Apply various hand stitching techniques.
- Demonstrate various garment repair techniques.
- Demonstrate various pressing techniques used in the construction and care of apparel.

Employees apply sewing, repairing, and pressing techniques in apparel manufacturing settings, custom sewing businesses, and alterations and mending businesses and departments. Experience and skill in sewing, repairing, and pressing helps one gain employment in the textiles and apparel industries. A basic understanding of clothing construction and repair assists employees even if these tasks are not performed daily. For example, a salesperson is more likely to recognize quality in ready-made apparel if he or she understands the characteristics of a well-made garment. In order to perform efficiently in any employment situation, employees must also be able to organize and manage their work, time, and energy well.

As discussed in Chapter Two, various jobs are available that involve the use of sewing, repairing, and pressing techniques. In the area of clothing services, jobs such as alterationist, repairer, presser, custom sewer, and custom sewer's assistant require such skills. In the area of clothing production and management, sewing machine operators, tailors, dressmakers, and tailor's/dressmaker's assistants must use sewing, repairing, and pressing techniques. Of course, fashion designers, sample makers, and other employees in the area of textiles and clothing design must understand basic construction techniques in order to perform their responsibilities well.

WORK MANAGEMENT AND MOTION ECONOMY

Good work methods involve use of the principles of motion economy. ***Motion economy*** means using time saving techniques and being more efficient. By applying motion economy techniques while sewing, repairing, and pressing, an employee in an industrial sewing plant can earn more money by producing more work. Employees in other related occupations can also increase production by accomplishing more work than before within the same amount of time.

The following guidelines outline the basic principles of motion economy as applied to sewing, repairing, and pressing garments.

- Use simultaneous pickup and disposal. Use both hands to perform separate tasks during some parts of the process. Pick up one piece while passing on a completed piece.
- Use simultaneous pickups. When work involves pickup and assembly of two pieces, pick up both pieces at the same time. When the left hand disposes of one piece and the right hand reaches to grasp the next piece, move the left hand to grasp the second piece. Use both hands to pick up, position, and align the work at the sewing machine. Do not use the right hand to pick up and deliver one piece until the left hand is available to deliver the second piece.
- Position work to reduce movements. To save time when picking up two pieces at once, position the piece on the right that will be placed underneath and the piece on the left that will be placed on top. This process eliminates regrasping the pieces.
- Spread out, fold, or handle work in several steps as necessary to position it correctly. Tasks such as matching notches or feeding edges into a second folded piece may be necessary during positioning.
- Eliminate regrasps. Grasp the pieces at the points where they will be assembled. This process prevents regrasping. Notice whether the thumb is on the top or bottom during the grasp, pickup, and delivery. If one or both hands must be repositioned during the task, save time by grasping differently.
- Grasp pieces with the thumb down on the right hand when sewing long seams. The right hand should have fingers on top and the thumb underneath. This position allows sewing all the way to the point of grasp without stopping.
- Keep the right hand busy. Do not allow the right hand to rest while the left hand guides the fabric under the sewing machine needle. Immediately move the right hand to its next job.
- Attempt to perform another part of the task, such as the pickup or disposal, during the sewing phase to save time.
- Sew with the fewest steps possible. Try to sew long sections of seams without stopping frequently.
- Accomplish work during positioning if possible. For example, fold a corner or turn a seam back during the pickup and position stage so extra steps are not required before sewing. Use both hands efficiently.
- Reduce unnecessary body movements to prevent energy loss. For example, if one must move the lower part of an arm to complete a task, do not move the upper arm and avoid twisting or turning the body.
- Pick up and dispose of pieces on the same side of the work area. If using both hands to dispose of a piece, perform both pickup and disposal on the left side.

This process reduces body movement and allows one to focus vision on the hands and the work.

- Use both feet on the treadle of an industrial sewing machine for best machine control. This method reduces fatigue because the body is in the most natural position for sewing.
- Use the maximum speed possible that allows machine control and quality work. Concentration on working too slowly usually reduces productivity.
- Use the machine treadle brakes. Learn to set the heels firmly on the back of the treadle and make sharp, quick stops instead of coasting to a stop.
- Save time by shortening the distance the hand must travel to pick up work.

THE SEWING PROCESS

There are various types of sewing machines designed for different sewing tasks. Information on these machines is provided in Chapter Nineteen. When using a sewing machine to construct or repair garments, it is important to organize work in order to save time and energy. ***Garment construction*** involves the joining of smaller shaped garment pieces together into larger units. ***Garment repair*** involves resewing seams, reattaching fasteners, patching holes, and many other procedures used to return a garment to a usable condition. Sewing procedures vary with different operations.

The ***fit*** of a garment refers to how tight or loose it is on the person wearing it. When a garment is the right size and does not pull tightly or sag loosely, it is considered to be a good fit. Garments are designed for different looks and different purposes. A ***fitted garment*** is shaped so that it follows the lines of the body. For many years, there have been three primary methods of making apparel. The methods are the draped, tailored, and composite methods. ***Draped garments*** are those that are wrapped or hung on the body. ***Tailored garments*** are made by cutting garment pieces and sewing them together to fit the shape of the body. ***Composite garments*** are made by combining the tailored and draped methods. Garment parts are cut and sewn. Some garment parts may fit the body closely while others may be draped.

Machine Control

Good ***machine control*** means the operator can sew at a desired speed and can start and stop the machine as desired. It also means that the operator can feed materials through the machine evenly and can use the machine to accomplish the tasks for which it was designed.

The sewing machine's speed is controlled by the pressure of the operator's foot on the treadle (foot control). The treadle can be controlled with either one or both feet. The ball of the foot controls the speed and the heel controls the break. Less pressure is applied to sew slowly; more pressure is applied to sew fast. The break is pressed to stop the machine. The machine is stopped when the needle is at its highest point unless the work must be turned. Usually, the needle should be at its lowest position to turn a corner. While the needle is in the fabric, the presser foot is raised and the work is turned.

Threading

Every sewing machine has thread guides. The thread must go in, around, over, under, or through these guides in order to deliver the thread at the needle under a specified tension. The machine will probably sew even though one or more thread guides are skipped, but it will not sew as efficiently. If enough thread guides are skipped, the machine will not sew. Skipped stitches and breaking thread are often caused by incorrect threading; therefore, thread guides are the first places to check when these problems occur.

The thread chart in the sewing machine manual of the machine should be studied in order to become familiar with proper threading procedures. The threading instructions should be followed exactly. If a chart is not available, a supervisor should be asked for instructions on how to thread the machine correctly.

When operating an industrial sewing machine, the thread is drawn over the guide that is on the thread stand directly above the spool. This guide helps unreel the thread with the least amount of friction. It is important to thread the needle from the proper direction. Many sewing machine needles are threaded from the side with the long groove. Lock stitch machines and some other types of sewing machines have a bottom thread that comes from the bobbin. It is important to check the bobbin to see that the thread is unreeling properly as part of the threading procedure. Some machines such as a chain stitch machine require special tools, such as a threading wire and tweezers, since some threading points are very difficult to reach.

Stitching

A United States Government reference manual, *Federal Standard 751a* (FS751a) defines and classifies seams, stitches, and stitchings. Some apparel manufacturers use these classifications to describe their processes while others do not use them. According to FS751a, a ***stitch*** is a formation of thread used to make a seam. A ***seam*** joins two or more plies (layers) of fabric. Seams are used to fasten together shaped fabric pieces (garment parts) to create garments. Machine stitching is done for both functional and decorative purposes.

The original sewing machines could form stitches only as rapidly as an operator could propel the treadle that turned a balance wheel. Today, fabric is stitched at speeds up to 15,000 stitches per minute (SPM). The speed for stitching depends on the nature of the operation. Long seams can be stitched at full speed as far as the operator can reach without regrasping the work. Sometimes the operator can sew only a few stitches at a time. One must be very skilled to machine stitch complex curves and patterns. In most cases such procedures require stopping frequently unless the operator has practiced these tasks many times.

Different types of stitching are done using different types of sewing machines. In an apparel manufacturing setting, the type of stitching chosen for a particular task depends on various factors including the following:

- design and style of the garment
- use or function of the garment
- care of the garment
- type and weight of fabric selected
- placement of the stitching
- availability of sewing machine(s) and attachments
- method of construction
- method of production
- quantity of garments produced

Machine sewing stitches are grouped into eight classes based on FS751a. Each class is identified by the first digit of a three digit number, 100 through 800. These standard stitch classes are as follows:

- 100 – chain stitch
- 200 – hand stitch
- 300 – lock stitch
- 400 – multi-thread chain stitch (double-locked stitch)
- 500 – overedge stitch
- 600 – flat seam stitch
- 700 – single thread lock stitch

- 800 – simulated hand stitch

Industrial sewing machines are used in manufacturing plants where textile products such as apparel are produced. Usually, each type of industrial machine is designed to produce one particular type of stitch. With adjustments, some machines may produce more than one type of stitch. Conventional sewing machines are designed to produce a variety of stitches for use in a wide range of construction techniques.

Sewing machines have stitch regulators that can be adjusted so the machine sews a selected number of stitches per inch. Depending on the type and weight of fabric used, number of plies sewn, type of thread used, and type of sewing machine, different results may occur. The stitch regulator is used as a starting point. However, stitching samples should be done for each project to ensure that the correct stitch size is selected.

Guiding, Aligning, and Repositioning Work

Part of sewing involves guiding the work so that stitching falls within the standard margins. Some industrial machines have trimming attachments. When using these trimming attachments, it is important to not trim away too much material. Stopping during the sewing operation may be necessary for a variety of reasons. The most frequent reason is to realign work. It may be necessary to make several stops if controlling several layers of fabric. Complex curves and patterns may require stopping to keep stitching within acceptable margins. Replacing an empty bobbin or securing supplies such as tape, braid, or binding also requires stopping. Occasional thread breaks result in stopping to rethread the machine.

Sometimes a sewing machine operator must perform several stitching operations on one part of a sewing project. Stops may be necessary to add other pieces to the work being sewn. Tabs, labels, loops, gussets, reinforcing tapes, cords, or strips that cannot be inserted while sewing is in progress also require stops. Edges that must be folded by hand and gathers that must be pinched just before the work passes under the presser foot are also example reasons an operator may have to stop.

Releasing Work

Work must be released (separated from the sewing machine) at the end of each sewing procedure. The most efficient way for sewing machine operators to release work is to sew it out in a continuous chain. This process involves having several pieces of work ready to sew at one time. As one item is completed, another piece is immediately fed through the needle area so that the items are temporarily connected by a chain of stitching. After several items are stitched, the items are disconnected by cutting the chains of stitching.

A second way to release work is to stitch to the edge of the work, pull it to the rear of the machine, and break the sewing threads by hand. When the operation does not include stitching to the edge, the work may simply be released when necessary by stopping, raising the needle and presser foot, pulling the threads to convenient lengths, and trimming the threads by hand with scissors, shears, or snips.

Frequently, the operator is instructed to sew a reinforcing stitch or a backstitch at the end of the seam before releasing the work. The operator may be required to hand trim the finished work to straighten irregular or frayed edges, and to clip loose threads. However, in some manufacturing plants, sewing machine operators do not perform tasks such as trimming and clipping. In some situations, these tasks are performed by another employee in order to speed the sewing process.

BASIC SEWING TECHNIQUES

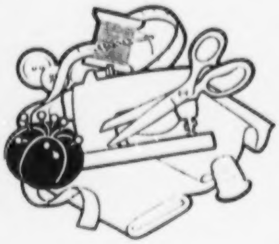
Learning basic sewing skills prepares people for actual sewing operations. Sewing machine operators must learn to position work, follow straight and curved lines, turn corners, start and finish seams, and back tack or backstitch before beginning an actual sewing operation.

The mark of professional sewing is a perfect seam. A perfect seam is one that is not puckered, stretched, or crooked and is finished without tangled threads. This smooth appearance is the result of careful machine control. If the stitching does not meet the standard of the employer, the operator should rip it out and restitch it. Correcting mistakes contributes to professionally-finished garments.

Good machine stitching has the following characteristics:

- Stitching is smooth with no tangles, loops, or puckers.
- Seams begin and end at exactly the appropriate points.
- Stitching follows the stitching line smoothly and accurately.
- The stitch length and tension are appropriate for the fabric texture and weight.
- The stitches are all the same size.
- There are no skipped or broken spots in stitching.
- The stitching does not cause the fabric to be off-grain due to stretching.
- The upper and lower threads are locked between layers of fabric.
- Repaired seams appear as one line of stitching.

Although there are certain widths of seams that are commonly used, seam widths sometimes vary. There are many types of ***seam guides*** to help sew seams the desired widths. Some sewing machines have metal guides that may be fastened securely at appropriate distances from the needle. Some machines have lines etched into the throat plate at several widths. Commonly-used seam widths can also be marked on the machine with several strips of colored cloth tape.



It is important to watch the stitching width when sewing curves and when edgestitching. More information is presented later in this chapter on stitching curves. ***Edgestitching*** is performed close to an edge and may be done either on the right or wrong side of the fabric. For even stitching, the fabric is guided by lining up the edge of the fabric with some point on the sewing machine or the edge of the presser foot.

Backstitching

Backstitching or ***back tacking*** involves sewing back and forth over the same row of stitching or sewing several stitches in one spot. It may be performed at either the beginning or end of a seam or at both ends. Backstitching is not used on every seam. It is used when no other stitching is placed over the ends of a seam to keep it from raveling. It is also used when sewn parts will be handled many times before another row of stitching is sewn over the end of a seam. Backstitching cannot be done on a chain stitch machine.

Staystitching

Staystitching is used to prevent seam lines from stretching out of shape while a garment is being constructed. Staystitching is done by sewing at regular machine stitch lengths in specified directions just inside the seam lines of individual garment pieces. Staystitching is performed after the garment pieces are cut out and before they are basted or sewn together. It is most important to staystitch along curved and angled seam lines such as at the neck, armhole, and shoulder. On loosely woven fabrics, all seam lines should be staystitched. Staystitching is performed with the grain of the fabric as much as possible. Figure 9.1 shows an example of how staystitching is done during the construction of a shirt or blouse.

Staystitching a Blouse or Shirt

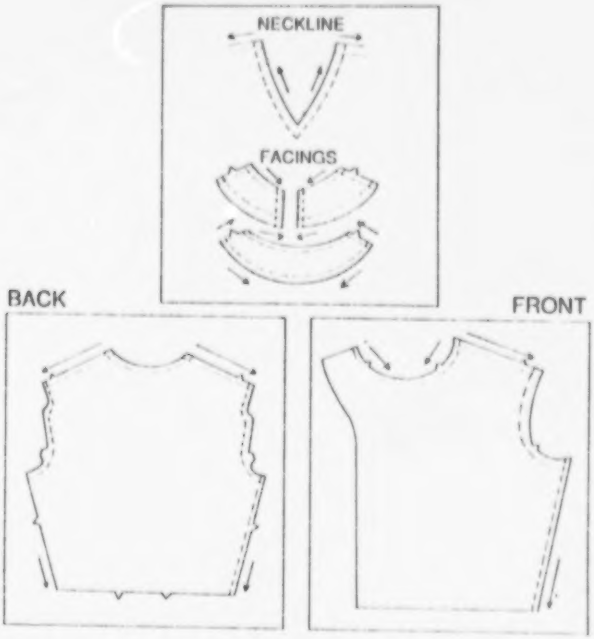


Figure 9.1

Basting

Basting is hand or machine stitching that temporarily holds two or more parts of a garment together. ***Machine basting*** is used for pleats, zippers, hems, or for holding facings and interfacing. Basting is usually removed after the seams are permanently sewn, but the basting can be left if it is not visible on the right side of the finished garment. A long, loose stitch on either lock stitch or chain stitch machines can be used for machine basting. The longest machine stitch is about 1/5" (the length of five stitches per inch). Hand-basting stitches can be any length but are often 1" long. Loose basting stitches are easier to remove than tight stitches.

Experienced sewers can increase the length of the machine-basting stitch by pulling the fabric out from behind the needle. However, care must be taken to prevent bending or breaking the needle or tearing the fabric. This method is used if the stitch must be longer than the machine can produce. The fabric may also be pulled if the machine makes small stitches as a result of the thickness of the fabric. The presser foot is raised slightly to allow the work to be pulled past the feed teeth.

Understitching

Understitching is a line of stitching applied near a seam line to make facings and seam allowances lie flat. It is often used around neckline facing seams when constructing garments. Seam allowances are trimmed, notched, or clipped after the seam is stitched. In addition, seam allowances are graded before understitching is done. ***Grading*** involves trimming the plies of the seam allowances of one seam to different widths in order to reduce thickness and eliminate bulk from the seam allowance. Figure 9.2 illustrates the procedures to follow in order to understitch.

Understitching Procedures

1. Grade both seam allowances.
2. Open out facing.
3. Press seam allowance toward facing.
4. Place garment on machine right side up.
5. Place facing and seam allowances away from outer garment fabric.
6. Check that seam allowances are smooth under facing.
7. Stitch close to seamline through facing and seam allowances.

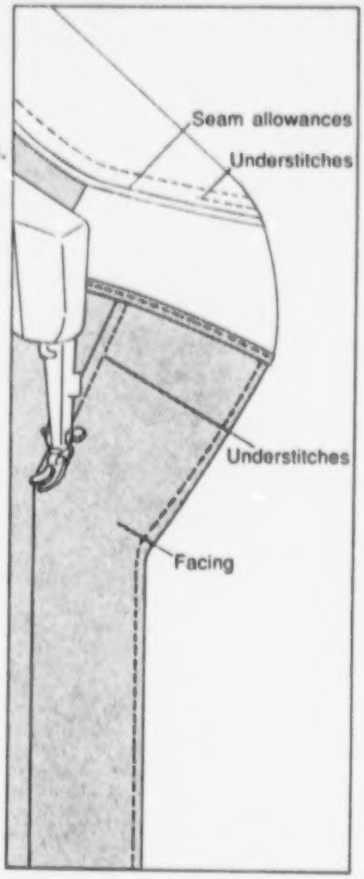


Figure 9.2

Topstitching

Any row of stitching visible on the outside of a garment is ***topstitching***. It may also be called ***finish stitching*** or ***surface stitching***. Topstitching requires speed, accuracy, and neatness. In some apparel manufacturing situations, operators learn to judge spacing for topstitching by sight alone. Topstitching is performed by stitching longer-than-average stitches on the right side of the garment with sewing thread, doubled sewing thread, or heavy thread.

Sewing Corners, Points, and Inserts

A ***corner*** is an angle of ninety degrees or more. Turning a corner involves making two connected rows of straight stitching in different directions. The process of turning a corner while stitching is called ***pivoting***. To pivot, the following steps should be used:

- Sew to the corner, stopping exactly at the corner.
- Leave the needle in the fabric if using a lock stitch machine.
- Leave the needle at its highest point if using a chain stitch machine.
- Raise the presser foot.
- Swing the fabric around the corner.
- Finish stitching the seam.

A ***point*** is an angle of less than ninety degrees. Sewing points accurately requires skill. In some cases, a sharp point may be sewn by making three or four curved stitches. This usually involves making several pivots. The fabric is turned slightly at each stop and a single stitch is made as the handwheel is turned with the right hand. The seam is then completed.

Inserts include items such as labels, loops, and tabs that are sewn on top of, on the bottom of, or between plies of fabric. Inserts are usually placed near the hand used to pick them up. This process prevents unnecessary hand movement. The machine is stopped at the point where the insert is to be placed. The insert is then placed on the seam and stitching is done. Sometimes, the insert is backstitched. Some inserts, such as garment hangers, have two ends to be stitched. Each end is inserted individually.

Darts

Darts are used to shape a flat piece of fabric to fit the curves of a human body. Notches, chalk marks, or thread markers are used to indicate where to stitch. These markings are followed exactly to ensure the proper shape and fit of the finished garment. The two basic types of darts are single-pointed darts and double-pointed darts. Darts are used at places such as necklines, bust lines, elbows, and waistlines. Darts can be shaped as well as straight.

For a ***standard dart*** or ***single-pointed dart***, the dart is folded in half and pinned. Marks such as notches are matched. In some cases, darts are basted before permanent stitching is done. A straight seam is sewn from the notch to the dart point's marker. Figure 9.4 shows the steps for sewing a standard dart.

Single-Pointed or Standard Dart

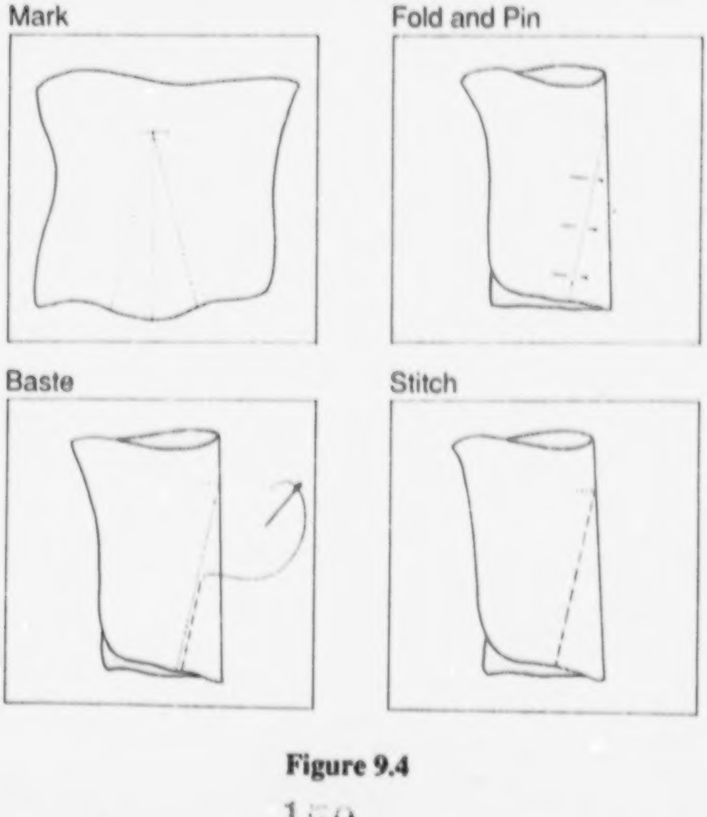


Figure 9.4

A ***double-pointed dart*** or ***contour dart*** is made by folding the garment piece along the fold line with right sides of the fabric together. Both sides of the dart are pinned by matching the stitching lines and the dart is basted. The pins are removed and the dart is stitched. The dart is stitched by beginning at the middle and stitching to one point. The garment piece is turned over and the other half of the dart is stitched. Stitching is overlapped at the wide part in the middle of the dart. Figure 9.5 illustrates the steps for stitching a double-pointed dart.

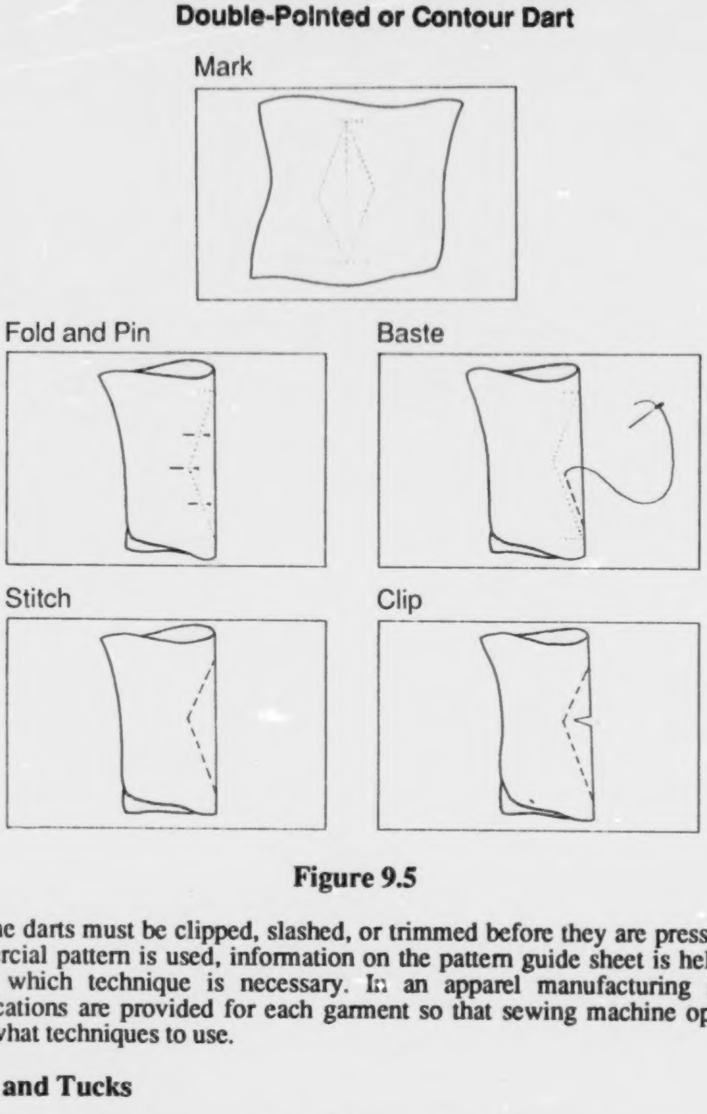


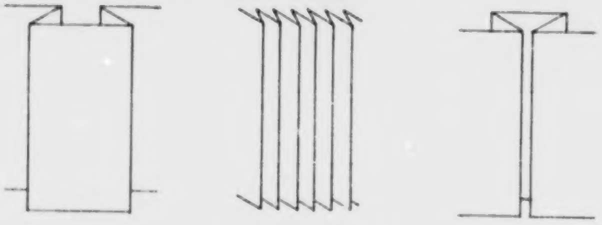
Figure 9.5

Some darts must be clipped, slashed, or trimmed before they are pressed. If a commercial pattern is used, information on the pattern guide sheet is helpful to decide which technique is necessary. In an apparel manufacturing setting, specifications are provided for each garment so that sewing machine operators know what techniques to use.

Pleats and Tucks

Pleats are folds in fabric. ***Tucks*** are stitched fabric folds. Pleats and tucks are used to add design interest and to control fabric fullness in a garment. The three common types of pleats are knife or side pleats, box pleats, and inverted pleats. Illustrations of these three types of pleats are shown in figure 9.6.

Pleats that are to be open on the finished garment may be sewn with a basting stitch during construction that is later removed. Pleats can also be formed by stitching across the top edge of the fabric after it has been folded, using the notches as a guide. This stitching holds the pleats until they are sewn into another seam. The last section of this chapter provides information on pressing techniques used when constructing pleats.



Box pleat

Side or knife pleats

Inverted pleat

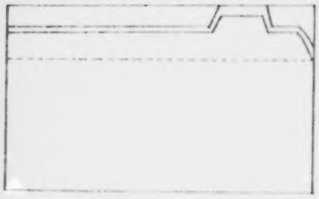
Figure 9.6

Tucks are usually not as deep as pleats. The width and spacing of tucks can be varied for different design effects. To construct tucks, stitching lines are matched, pinned, and stitched. Tucks are first pressed flat and then to one side.

Buttonholes

Buttonholes are made either by machine or by hand. The hand method is described in a later section of this chapter titled "Hand Stitches." The machine-made buttonhole is made with the zigzag stitch on zigzag machines or with a buttonhole attachment on straight stitch machines. The buttonhole is made of two straight sides of zigzagged satin stitch with bar tacks at the ends. After the buttonhole is made, the buttonhole's center is cut with an attachment on the machine, buttonhole scissors, or a buttonhole cutter.

BASIC SEAMS AND SEAM FINISHES



As defined earlier, a seam is a row or rows of stitching that hold(s) two or more layers of fabric together. There are various types of seams. A few basic seam types are presented in this chapter. A ***straight seam*** is formed when the fabric edges and the seam line are perfectly straight. When a straight seam is completed, plies should come out the same length with edges even, seams should be sewn the required width, and seams should not pucker. To sew a straight seam, the following procedures may be used:

- Position at least two plies of fabric with one on top of the other and the edges even.
- Place the needle at its highest position to begin stitching. Pull the top and bottom threads under the presser foot toward the back of the sewing machine.
- Raise the presser foot enough to position the work even with the needle hole. Align the edge of the work with the seam guide being used.
- Lower the presser foot while holding the fabric with the right hand.
- Grasp the edge of the fabric nearest the seam to be sewn with the index finger on top and the thumb on the bottom. Spread out the other three fingers and let them touch the machine bed.
- Pull the thumb back as the hands and the fabric move toward the needle, leaving just the index finger to hold the fabric tightly. Continue sewing until the finger touches the end of the presser foot.
- Move the hand in a straight line between the body and the sewing machine needle.
- Start the machine slowly, feeding fabric evenly so that it remains tightly stretched.
- Stop the sewing machine and reposition the hands when necessary. It may be necessary to reposition the hands several times during one sewing procedure if the seam is very long.

- Slow down as the end of the seam to prevent sewing off the fabric and damaging the sewing machine. Attempt to stop the machine not more than one or two stitches beyond the end of the seam.
- Stop sewing with the needle and the take-up lever in their highest positions.
- Raise the presser foot slightly and release the fabric.
- Pull the work away in the appropriate direction and break or clip the threads. Sometimes sewing machine operators are instructed to leave the threads attached to the next piece of work.

When sewing a curved seam, an imaginary curve should be followed as the fabric is fed into the machine. All stitches should be the same distance from the edge around the curve. Curves are stitched like straight seams, but require more control of the fabric.

Other types of basic seams include gathered seams and eased seams. A ***gathered seam*** is formed when the edge of a long fabric piece is gathered up to match the second edge of a shorter piece of fabric and sewn together. An ***eased seam*** is formed to join the edges of two plies of fabric that are slightly different lengths without forming gathers. The extra length is eased so that puckers and gathers are not created. Additional information on gathered and eased seams is included in Chapter Twelve.

Seam finishes are techniques used to make seam allowances look neater and prevent the edges from raveling. They extend the life of a garment and add a professional appearance. Various seam finishes can be used. A few basic seam finishes are described in this chapter. The seam finish selected for a garment depends on the type and weight of the fabric, the wear the garment will receive, and whether or not seams will be seen. Plain, straight seams are finished after they have been pressed open. Plain, curved or cornered seams are finished, clipped or notched, and pressed open.

Every seam should be pressed before it is crossed with a second line of stitching. Depending on the type of seam and location of the seam, other techniques may be required also. Seams may be trimmed, graded, notched, or clipped. Figure 9.7 illustrates basic procedures for trimming, grading, clipping, and notching various types of seams.

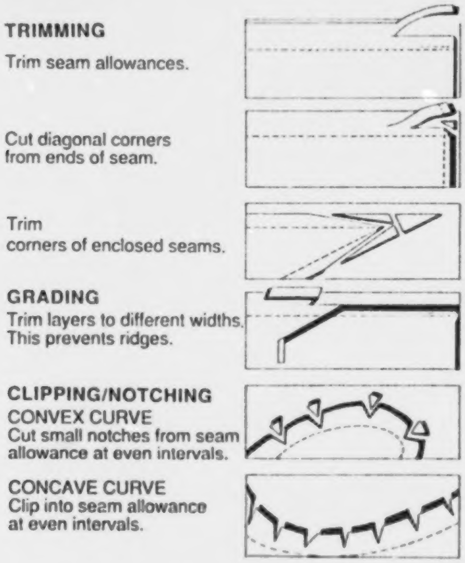
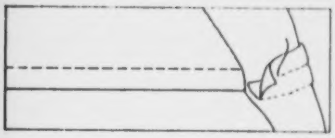

TRIMMING
Trim seam allowances.
Cut diagonal corners from ends of seam.
Trim corners of enclosed seams.
GRADING
Trim layers to different widths. This prevents ridges.
CLIPPING/NOTCHING
CONVEX CURVE
Cut small notches from seam allowance at even intervals.
CONCAVE CURVE
Clip into seam allowance at even intervals.

Figure 9.7

Trimming involves cutting away a part of the seam allowance to reduce bulk. As previously discussed, grading is a method of trimming a seam with two or more thicknesses of fabric in a seam allowance. Each seam allowance is trimmed to a different width to reduce bulk. ***Clipping*** involves cutting a seam allowance on an inside curve so that the seam will lie flat when the garment is turned right side out. The points of the scissors or shears are used to cut into the seam allowance at right angles. ***Notching*** is a method of cutting out V-shaped pieces from a seam allowance on an outside curve so that the seam will lie flat when the garment is turned right side out.

Welt Seam

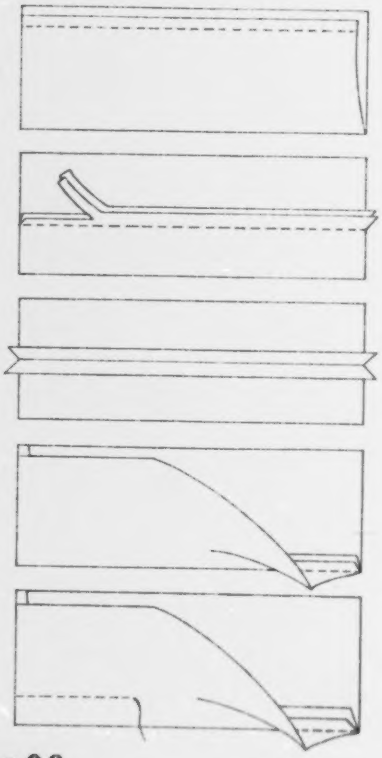


To make a ***welt seam***, a plain seam is stitched and pressed toward the side to be topstitched. One seam allowance is trimmed to 1/4". The wider seam allowance is pressed over the trimmed edge of the other seam allowance. The seam is topstitched 1/4" to 1/2" from the seam line on the right side of the fabric.

French Seam

The French seam is used on fine quality garments to prevent raw seams or raveled edges and to strengthen seams. It is especially used for visible seams such as those on sheer fabrics and in unlined jackets. The ***French seam*** is a self-enclosed seam that is stitched on both sides of the fabric. The first seam is made with the wrong sides of the fabric garment pieces placed together. The seam allowances are trimmed. The seam is then folded the other direction with right sides facing and is stitched again. Figure 9.8 illustrates procedures to follow in constructing a French seam.

French Seam



Stitch 3/8" from edge.

Trim seam allowances to 1/8".

Press seam open.

Fold right sides together.

Stitch on seamline.

Figure 9.8

Trimming of seam allowances is usually performed with a trimming attachment in manufactured garments. They are trimmed by shears or a trimming attachment when sewing with conventional machines. Trimming ensures an even seam width to cover and enclose seam allowances. The finishing seam must be wide enough to cover the cut edges of the previous seam, but it should be as narrow as possible to avoid bulk. This type of seam is usually used on straight seams; the French seam is difficult to sew if the seams are curved.

Another type of seam called a ***mock French seam*** can substitute for the French seam on curved seams. It is made by sewing a plain seam first. The seam allowances are trimmed to 1/2". Each seam edge is turned in 1/4" and pressed. Folded edges are stitched together and pressed to one side.

Flat-Felled Seam

The ***flat-felled seam*** is a durable seam that is used for garments that receive much wear and repeated washings. It is a very sturdy seam and is used commonly on jeans and other clothing such as tailored shirts, pajamas, work clothes, sportswear, and children's clothing. The raw edges of the seam allowances are enclosed in the process of making the flat-felled seam. This seam is appropriate for use on straight edges and very shallow curves. Figure 9.9 illustrates the steps involved in producing a flat-felled seam.

Flat-Felled Seam

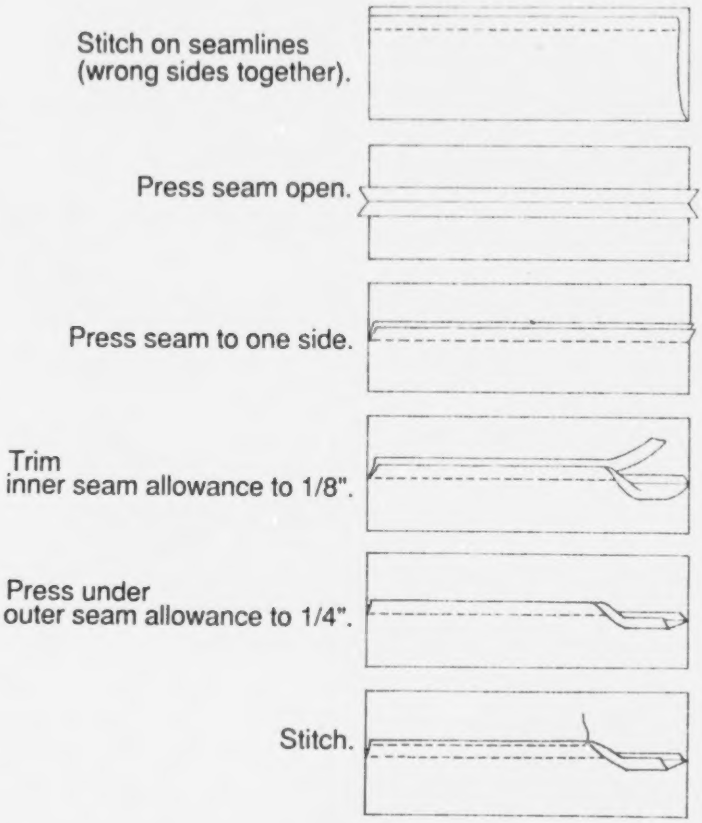
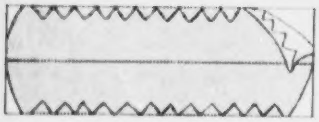


Figure 9.9

Double-Stitched Seam

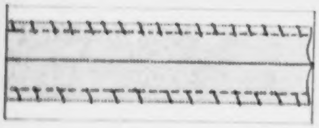
Producing a double-stitched seam involves sewing and finishing the seam in two steps. To produce a ***double-stitched seam***, a plain seam is stitched first. The seam is trimmed to 1/4". The seam is completed with a row of straight stitches 1/8" from the first row of stitching. Sometimes, if the double-stitched seam is used on lightweight woolens or knits, zigzag stitching is used instead of straight stitching.

Zigzag Seam Finish



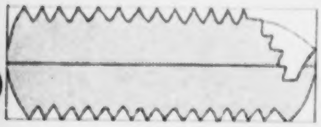
A ***zigzag seam finish*** is a series of alternately angled stitches applied to the raw edges of a seam allowance. The fabric is positioned so that one side of the angled stitches will form over the edge of the fabric. If the stitches do not form over the edge of the fabric, the fabric is trimmed to the edge of the stitching.

Hand-Overcast Seam Finish



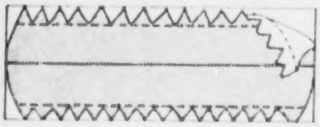
To produce a ***hand-overcast seam finish***, a single thread is used to make slanted stitches at the edge of each seam allowance. Stitches should be slightly more than 1/8" deep and 1/4" apart. The thread should not be pulled too tightly. The hand-overcast seam finish is used when use of a machine finish is not practical.

Pinked Seam Finish



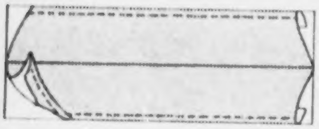
A ***pinked seam finish*** is made by trimming the seam allowances with pinking shears before pressing the seam. The seam allowances are trimmed close to the raw fabric edge. The pinked seam finish is used when working with fabric that will not ravel easily.

Pinked and Stitched Seam Finish



To produce a ***pinked and stitched seam finish***, a line of short stitches is machine stitched 1/4" from the seam allowance edge. The edge of the seam allowance is trimmed with pinking shears.

Clean Finished Seam



To produce a ***clean finished seam***, the edge of the seam allowance is turned under 1/8" (or 1/4" if fabric ravels easily). The edges of the seam allowance are pressed. The edge of the fold is machine stitched. A straight line of machine stitching at the 1/8" or 1/4" fold line makes it easier to fold the fabric edges under.

HAND STITCHES

Few garments can be completed without any hand stitching. Hand stitches are often used in alteration and repair of garments. ***Hand stitches*** involve a variety of stitches made with a hand needle including basting, a fast temporary stitch, and a wide range of permanent stitches. Permanent hand stitches are used for hemming, tacking, sewing on fasteners, overcasting, and handworking buttonholes.

The following steps may be used to perform hand stitches:

- Chose the right size needle for the type of fabric and thread.
- Use a single 18" to 24" length of thread, coated with beeswax for added strength and slipping ease.
- Cut the thread at a slant and never break, bite, or tear it.

- Thread the cut end through the needle and knot it.
- Wear a thimble on the second finger of the sewing hand.
- Keep stitches fairly loose to avoid a puckered or tight look.
- Fasten the thread in the fabric by taking a few small backstitches or by making a knot at the end of the thread and hiding it on the wrong side of the fabric.
- Use either backstitching or knotting to end stitching.

Each hand stitch serves a definite purpose. Stitches that hold the garment together must be lasting, such as the backstitch. The hem of a skirt or sleeve is held in place with hemming stitches or slipstitches. Lightweight fabric can be sewn quickly with a running stitch. The running stitch can also be used for hand shirring. Overcasting stitches keep edges of fabric from raveling.

Use the following guidelines to make hand sewing faster and easier:

- Lay most of the work down or place the work toward the body holding only the edge in the hands. This process makes the work easier to handle, increases stitching speed, prevents crushing the fabric, and eliminates cramped hands.
- Work from right to left if right-handed (with the exception of the catchstitch). Work from left to right if left-handed.
- Turn the narrow edges of the work across the forefinger of the hand holding the work.
- Slant the needle toward the shoulder opposite the sewing hand for most stitches. Pointing the needle toward the body is less awkward and tiring than pointing it away from the body.
- Begin and end sewing on a part of the garment not seen from the outside of the garment such as a seam allowance.
- Avoid pulling the thread too tightly. Leaving stitches loose prevents puckering and breaking of the threads during wear and laundering.

Holding Hand Work

Work may be held for hand sewing using several methods. One method is to keep the work flat on the table for hand sewing pleats, folds, lapped seams, long seams, and hems that slip or stretch easily. Basting marking lines, catch-stitching, and basting underlinings or interfacings are also easier to do with the work flat on the table. The index finger of one hand is used to push up a small amount of fabric directly in front of the needle. Then, the needle is pushed through the fabric with the sewing hand, making one stitch at a time. All the thread is pulled through after several stitches have been made. To keep the work from slipping, the other fingers and the thumb of the holding hand are used. Figure 9.10 illustrates this process.

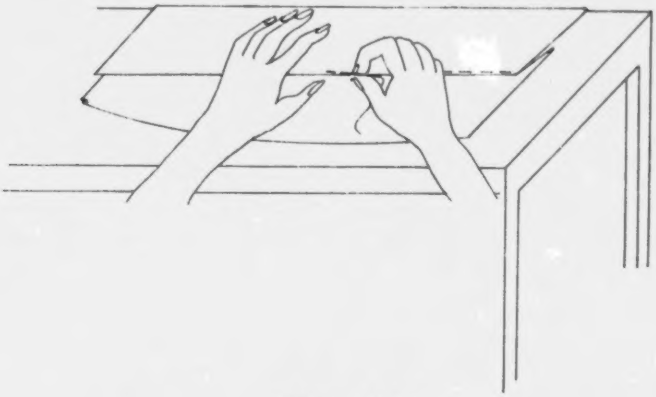


Figure 9.10

Another method of holding handwork is up off the table in both hands for making running stitches, gathering by hand, and easing in fullness. Working from side to side, small stitches are made with the sewing hand. The fabric is held between the thumb and forefinger of each hand. The needle is woven up and down through the fabric. The holding hand is used to move the fabric up and down at the point of the needle. When the needle has several small stitches on it, the needle is pulled through the fabric. The needle is left in place for the next stitch. Figure 9.11 illustrates this process.

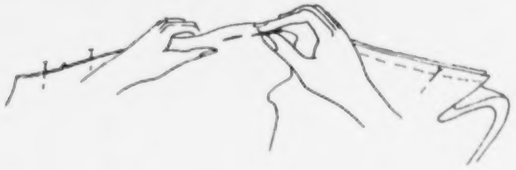


Figure 9.11

Handwork may also be held up and down across the forefinger of the holding hand for hemming, slip-basting, and many of the decorative stitches. This method is illustrated in figure 9.12.

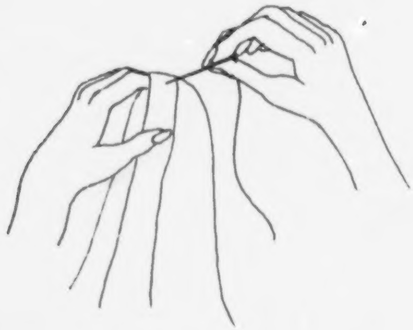


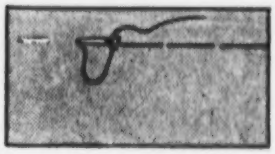
Figure 9.12

Another way of holding work is from side-to-side for overcasting. The work is pinched firmly between the thumb and forefinger of the holding hand.

Backstitch

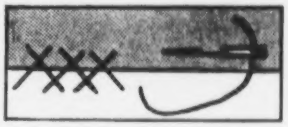
The ***backstitch*** is used to secure hand stitching at the beginning and end of a seam, to repair seams, and for topstitching, hand stitching zippers, and hand understitching. It is the strongest of the hand-sewn stitches. To secure stitching at the beginning or end of hand stitched seams, the needle and thread are positioned under the layers of fabric. The needle is inserted through all fabric layers about a stitch-length behind the last stitch. The needle and thread are pulled through the layers of fabric close behind the spot where the thread emerged from the last stitch. The shorter the backstitch, the more secure the stitch is. For an even more secure backstitch at seam ends, a loop of thread is left while making the backstitch by not pulling the stitch tautly. Another small backstitch is made on top of the first and the needle and thread are pulled through the loop. Stitches are pulled tautly and the thread is cut.

Basting Stitch



As previously discussed, the basting stitch is used to temporarily hold fabric layers together during fitting and construction until the layers can be permanently sewn. ***Even basting stitches*** are the same length on both sides of the fabric layers and is used where more control is needed than can be achieved with uneven basting. ***Uneven basting stitches*** appear longer on one side and shorter on the other side of the fabric layers. It is used for general basting and marking. For even basting, the work is performed from left to right. Several evenly-spaced stitches are placed on the needle before the needle and thread are pulled through the fabric layers. For uneven basting, the stitches are usually about one-fourth-inch long and spaced one inch apart.

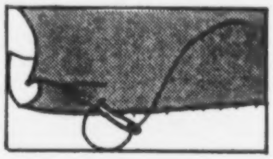
Catchstitch



The ***catchstitch*** is mainly used as a hemming stitch. The two types of catchstitches are the flat catchstitch and the blind catchsitich. The flat catchstitch is primarily used when hemming medium-weight to heavyweight knitted or woven fabric. The flat catchstitch is also used to hold facings to garment fabric and to attach interfacing to fabric.

The blind catchstitch or inside catchstitch is stitched in the same manner as the flat catchstitch but it is done between the hem and the garment fabric. The blind catchstitch is commonly used to hem knitted fabrics.

Slipstitch



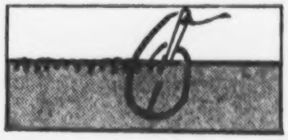
The ***slipstitch*** is used for hemming, tacking facings, attaching patch pockets, finishing waistbands, attaching trims, and attaching jacket linings. The stitches should be invisible on the right side of the garment. Sometimes, the slipstitch is done between the hem and the garment. This stitch is called the ***blind slipstitch*** and should be invisible on both the hem edge and the outside of the garment.

To hem using a slipstitch, the thread is fastened and the needle is brought up through the folded hem edge. A stitch is made in the garment fabric, opposite the point at which the thread came out, picking up just one or two fabric threads. The needle is inserted through the folded hem edge and slipped through the fold about o1/4". Stitching is done loosely.

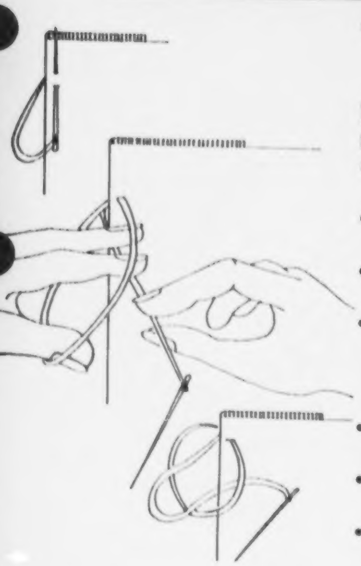
Blanket Stitch

The ***blanket stitch*** is used to decorate garments, patch garments, and make hand-stitched bar tacks. The blanket stitch is worked from left to right. The needle and the fabric's edge are pointed toward the body. The thread is fastened to the fabric and brought below the edge of the fabric. For each stitch, the needle enters the fabric from the right side and is brought to the fabric's edge. With the thread underneath the needle's point, the needle is pulled through the fabric to form the stitch.

Buttonhole Stitch



The ***buttonhole stitch*** is used as a decorative finish, to make hand-made buttonholes, and to attach snaps, hooks, and eyes. The fabric is placed away from the body and the needle is pointed toward the body. Stitching begins with the thread at the cut or outside edge of the fabric. The needle is inserted from the outside to the inside of the stitch. The needle is inserted from the back side to the front side of the fabric to form a vertical stitch. The thread is wrapped under the eye end of the needle first; then, the thread is wrapped under the pointed end of the needle. The thread is pulled completely through the fabric and left loose.

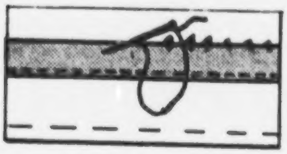


Thread Chain

Thread chains are used as belt carriers and loops for buttons. The chain can be fastened to the garment in a loop or made to lie flat against the garment. To make a thread chain, the following steps may be used:

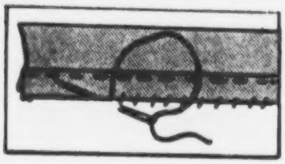
- Mark where the chain should begin and where it should be fastened onto the garment.
- Make a small stitch at the beginning mark and pull the thread through partially, leaving a large loop about 4" long.
- Use the thumb and first two fingers of the left hand to hold the loop open. Use the thumb and forefinger of the right hand to hold the thread supply.
- Reach through the loop with the second finger of the left hand, grasp the thread in the right hand, and pull the thread through the loop to start a new loop. As the new loop is being formed, the first loop should slide off the fingers and tighten as it is drawn near the fabric.
- Hold the new loop as the first loop was previously held with the thumb and two fingers.
- Continue making the thread chain using this process until the desired length is achieved.
- To finish the chain, slip the needle through the last loop and tighten the loop into a knot.
- Sew the chain to the fastening point on the garment.

Vertical Hemming Stitch



Hemming stitches are used to secure hems to garments. The flat, ***vertical hemming stitch*** has small floats passing over the hem's edge to the garment. It is suitable for hems finished with seam tape. The thread is fastened between the garment and hem (near the top of the hem), and the needle and thread are pulled through the hem's edge. One thread of the garment fabric is caught to begin each stitch. The needle is directed downward diagonally to pierce the hem's edge about 1/4" to the left. Then, the needle and thread are pulled through the fabric.

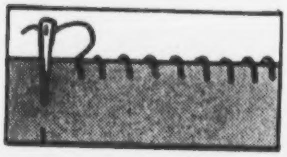
Blind-Hemming Stitch



Blind-hemming stitches are made between the hem and garment fabric resulting in hem stitches that are invisible. To make the blind-hemming stitch, the following steps may be used:

- Pull down a small portion of the hem edge and work the needle from right to left with the needle pointing to the left.
- Take a small stitch 1/4" to the left in the garment fabric, picking up only one or two threads from the fabric.
- Take the next small stitch 1/4" to the left in the hem.
- Continue the process, alternating the stitching in the garment fabric and hem.

Overcast Stitch

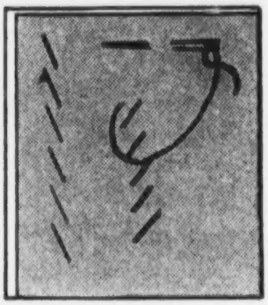


As discussed in the previous section of this chapter, the ***overcast stitch*** finishes the raw edges of seams or fabric to prevent raveling. Diagonal stitches are made over the edge of the seam or fabric an even distance apart and at an equal depth.

Running Stitch

Running stitches are used for seaming, tucking, mending, gathering, and other delicate sewing work. Running stitches are the same as basting stitches, except that running stitches are smaller and permanent. To make running stitches, a long, fine needle is woven in and out of fabric, taking several 1/8" stitches at a time.

Padding Stitch



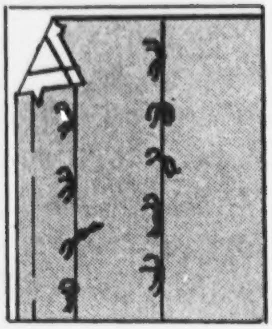
Padding stitches are used in tailoring to attach interfacings to outer fabric, and to form, control, and shape garment sections such as the collar and lapel. ***Padding stitches*** are permanent stitches that look like temporary diagonal basting stitches. Longer stitches are used for holding interfacing and garment fabric together. Short stitches are used to mold, form, control, and shape garment sections. Since padding stitches are permanent, they should not show on the garment's outer fabric.

French Tacks

French tacks hold two garment sections together, such as a coat and its lining, while keeping both sections loose. To make French tacks, a small stitch is placed at the top of the garment's hem edge. A small stitch is placed at a directly corresponding point on the other garment section, leaving 1" to 2" of thread slack between the two stitches. This process is repeated about two more times. Closely-spaced blanket stitches are then worked over the threads.

Tailor's Tacks

Tailor's tacks are used to transfer pattern markings and construction details onto fabric garment pieces. Tailor's tacks require more time than other transfer methods, but are necessary in some situations. An easy tailor's tack method for single layers is to make loose uneven basting stitches along the details and markings on the pattern with a double, unknotted thread. After the stitching is completed, the stitches are clipped in half. The fabric and the pattern are gently separated without tearing the pattern or pulling out the tailor's tacks.



For tailor's tacks on double layers of fabric, the pattern is slit at the pattern symbols to be marked. Using double, unknotted thread, a stitch is made through the pattern and fabric layers at each pattern symbol or marking. The thread is pulled through and a 1" thread end is left. A 1" to 2" loop is made by taking another stitch in the same place. Once the loop is made, the thread is cut 1" from the stitches. After all symbols are marked with tailor's tacks, the pattern is gently lifted from the fabric and thread markings. The fabric layers are separated and the thread loops are snipped between the layers.

GARMENT REPAIR TECHNIQUES

When customers purchase clothing or have garments cleaned, they expect them to be in good condition. Customers are disappointed if garments have loose or missing fasteners; ripped seams, or other repair needs. Cleaners and retail stores have alteration and mending specialists who identify and repair clothing problems. Some businesses also specialize in mending and altering clothing.

Buttons

Loose buttons should be resewn with a strong thread. A ***shank*** made of thread allows the buttonhole to lay flat under the button without strain. When a shank is made, two crisscrossed pins, a darning needle, a match stick, or a round toothpick is/are laid across the top of the button before sewing it to the garment. When enough stitches have been made to securely hold the button, the object used to help form the shank is removed. The button is pulled away from the fabric and thread is wrapped around the thread under the button to reinforce and to form the shank. The thread is fastened underneath the button on the garment's wrong side to finish the task. When a button is sewn on a coat, the needle and thread are woven around and in between the strands of thread under the button to form a sturdy shank with little bulk.

For buttons in locations that receive much strain (such as a heavy coat or a front-buttoned dress), cotton twill tape may be used as a reinforcement. The bottom three or four buttons are removed. A strip of 1/2" or 5/8" twill tape is stitched on the underneath side, down the center of the button line. The buttons are reattached to the garment.

If buttons or fasteners have been pulled away from the garment leaving a torn place or hole, a piece of muslin, cheesecloth, or the fabric itself is used under the tear for reinforcement. The hole or tear is mended on the sewing machine or by hand with small, closely-spaced, back-and-forth stitches until the entire surface is smooth and even. Fusible mending tape may also be used. The button is securely attached over the reinforced section.

Buttonholes

To repair worn buttonholes, the worn stitches are removed. Care should be taken to avoid stretching the buttonhole. After steam pressing the spot, the buttonhole is reworked with a strand of matching thread using a buttonhole stitch or blanket stitch. To repair a completely raveled buttonhole, machine stitching is used close to the cut edges of the hole. Then, the buttonhole is reworked by hand.

A torn buttonhole in lightweight fabric is mended by ripping out the old buttonhole stitching and placing a patch between the top and the facing of both sides of the buttonhole. The patch is extended beyond the full length of the buttonhole and tear. The tear is mended on the sewing machine by making tiny stitches back and forth over the worn places and through the patch until the entire opening is covered. A new buttonhole is made over the patched area with the sewing machine.

If threads of a handmade buttonhole break and ravel or if the buttonhole is stretched, the stitches should be removed. To repair the buttonhole, the edges of the buttonhole are steam pressed together. Hand stitches are made around the buttonhole close to the edges. If a buttonhole is machine stitched, a piece of sheer, lightweight fabric (such as organdy, voile, or batiste) should be placed underneath for reinforcement before the buttonhole is stitched around the opening. The buttonhole is then reworked by machine.

Snaps, Hooks, and Eyes

When snaps, hooks, and eyes are replaced or resewn, they are sewn onto the garment neatly and securely using a sturdy stitch such as the buttonhole stitch. A strong, but not heavy thread is used. To reinforce hammer-on or no-sew snaps, a row of machine stitching is placed on each side of the metal parts.

Seam Reinforcement and Repair of Rips

Employees in alteration/repair businesses or departments, laundries, and dry cleaners are often asked to repair rips and reinforce seams in garments. New garments with rips or skips in stitching are sometimes accidentally shipped to retail stores. Rips can also occur when customers try on garments.

Repairing ripped seams is a common mending task. In a retail store, several customers may try on a garment before it is purchased; therefore, seam repairs are often necessary. Repairs should be performed professionally and carefully. The garment should never appear worn or patched.

Repairs can be made either by hand or machine. When it is possible to reach the seam, it is best to use the sewing machine to repair. In some situations it is hard to get to the seam. Therefore, it is necessary to repair the seam with hand stitches. The thread used to make a repair should match the fabric as closely as possible. Thread a shade darker than the fabric blends well. Nylon, silk, or strong mercerized thread may be used for machine repairs. As discussed in Chapter Six, mercerization is a chemical bath applied to cotton or cotton-covered polyester thread to make it have greater strength, more luster, and a smoother surface.

In addition to the hand stitches described earlier, the lock stitch is often used to repair rips and seams. The ***lock stitch*** is an invisible stitch that is as strong as short machine stitches.

Because machine stitching breaks more easily in curved and bias seams, seam reinforcement may be required in these areas. Seam breakage occurs in other areas that receive strain. The following suggestions may be used for reinforcing seams and areas of strain in a garment:

- Machine stitch curved and bias seams using short stitches. Stitch again about 1/16" beyond the seam line.
- Use small machine stitches to restitch pocket corners that are beginning to rip due to strain.
- Use straight (twill) or bias tape to reinforce seams. Sew the tape to the inside of the seam, if possible. Use tape to reinforce armseye seams, necklines, plackets, and vents.
- Use bar tacks at the end of plackets to reduce the possibility of rips caused by strain.
- Restitch frayed seams and make them slightly wider if the fit of the garment is not affected. Finish the edges of the seams to prevent further raveling. Check with the customer before widening seams or doing anything to change the fit of the garment. If a garment fits the body closely, small changes in the seam lines will affect its fit.

Darning

Darning is a method of repairing a hole or tear by following the grain line and by anchoring new yarns in the fabric on all sides of the hole or rip. The process of darning involves covering broken yarns and replacing missing yarns. The process is only used to repair small holes in fabric. The repaired area looks much like the weave of the fabric. Darning may be performed on the sewing machine or by hand.

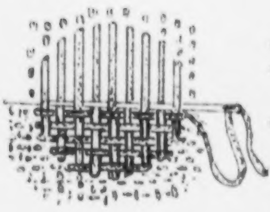
The following suggestions are helpful when making hand or machine darns that are hardly visible:

- Study the weave of the original fabric and make the darn look as much like the original weave as possible.
- Perform the work under the best light available.
- Use a fine needle and short thread. A long thread pulled back and forth across a torn place or worn hole can pull and stretch the damaged area out of shape. Sometimes, fabric yarns can be removed from seam allowances for use in darning.
- Perform darning on the right side of the fabric and blend it into the fabric around the hole.
- Attempt to make a flat darn. If yarns are pulled too tightly, the finished darn looks puckered. Stitching that is too loose gives the darn a puffy look.
- Attempt to weave the mending yarn or thread between fabric yarns, not in and out of the fabric.
- Make small stitches. Avoid pulling the thread too tightly when making a turn. Run stitches unevenly into the cloth around the darn in order to prevent a hard, heavy line around the darn.
- Pull the ends of darning yarns to the underside of the garment and cut them off, but not too closely. Work the darn so that all raw edges of the hole or tear are on the wrong side of the fabric.
- Steam press the finished darn from the wrong side. If fabric is wool or is napped, brush the darn to lift the nap.

A machine darn is a quick way to repair straight, three-corner, or jagged tears or diagonal cuts. A machine darn should be used if the darn will not show, if a mended hole can be covered by replaced buttons, or for reinforcing worn areas in work clothes. When darning on the sewing machine, the sewing machine feed should not be used. On some machines the feed can be lowered below the throat plate. On other machines, the throat plate is raised above the feed. The pressure should be released on the presser foot. The stitch length should be adjusted to a length that is appropriate for the fabric being repaired. Short stitches are best for cotton fabric. Fairly long stitches are best for knits since these fabrics are soft and flexible. A regular presser foot may be used or a special darning and embroidery foot may be used for more control. Fabric may be placed in a darner or embroidery hoop during the darning process to keep it tight.

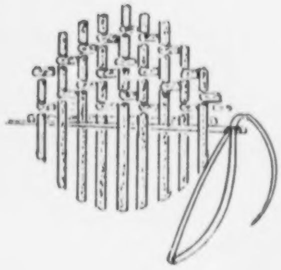
The following steps may be used to produce a neat machine darn:

- Place the damaged spot right side up over an ironing board, sleeve board, or other flat surface. Straighten or trim any tangled or frayed yarns.
- Cut a piece of underlay fabric (reinforcing fabric) from lightweight, fusible interfacing fabric. Make the underlay no larger than necessary to reinforce and hold the cut or torn area in place.
- Slip fusible interfacing fabric under the damaged area, adhesive side up. Hold the reinforcing fabric in place with pins. With yarns combed exactly in place, cover the mend with a thin cloth to protect fabric. Press the fabric. If necessary, press again from the inside.
- Use either silk or fine, cotton thread that matches the fabric's luster and is a slightly darker shade than the fabric. If a fusible interfacing is not used, baste a thin piece of fabric underneath the damaged spot. Outline the opening 1/8" or 1/4" from the edge, depending on the texture of the fabric. Machine or hand stitch back and forth over the damage, usually with the grain of the fabric. To prevent a ridge, run the stitches into the fabric so that the rows are not all the same length.
- Trim away any extra reinforcing fabric, unless it is needed to strengthen the area surrounding the damage.
- Tack reinforcing fabric invisibly to the back of the fabric with padding stitches.
- If damage is a three-corner tear, snag, or badly-frayed spot, machine stitch both crosswise and lengthwise.



The following guidelines are helpful for making a plain hand darn:

- Snip away ragged edges of holes.
- Steam press the area to be darned, pointing the iron toward the center of the hole.
- Choose darning yarn or thread that matches the fabric closely in color, weight, and luster. Use a fine needle, but do not knot the thread. Using nylon or silk thread makes the darn stronger and more serviceable. Using beeswax will also strengthen the thread. Hand darning works best on heavy wools and flannels.
- Use small running stitches beginning about 1/4" from the edge of the hole. Work back and forth, lengthwise, across the hole and far enough into the fabric to strengthen the thin or worn area that may surround the hole. A darn is less noticeable if stitches can be run into the underside of a woven area surrounding the hole. This is possible only if there is no thin or worn area surrounding the hole.
- Weave crosswise, over, and under the lengthwise yarns and into the surrounding fabric. Keep lines of stitching and thread over the opening parallel, evenly spaced, and even in length. Avoid pulling the threads too tightly since this will cause the darned area to pucker.



A pattern darn is used to repair small holes in suiting or dress fabrics with distinct weaves. A ***pattern darn*** is done to match the special weave of a fabric being repaired. Before making a pattern darn, the fabric weave should be studied carefully to see how lengthwise and crosswise yarns are interwoven. Using a magnifying glass is helpful. The fabric weave should be reproduced as closely as possible in the darn, using matching thread or yarn.

Patching

If the hole in a garment is very large, it is often better to patch than to darn. ***Patching*** involves covering a hole or a tear with matching or contrasting fabric or fitting a piece of matching fabric into a hole. Patching is a repair method used primarily in home sewing. Since it is not commonly used in industry settings, general information is provided in this chapter on patching procedures.

To patch, the area around the hole is pressed with the point of the iron directed toward the hole. The lengthwise threads of the fabric are pressed first; then, the crosswise threads are pressed. The damaged area should be cut into a square, rectangle, or oval, following the grain of the fabric. The patch selected should be appropriate for the task. Types of patches include hemmed, inset, straddle, lapped, knit stitch, and blanket stitch.

The following suggestions may be used to make patches that are not noticeable:

- When a damaged garment is a bit shrunken and faded, patch it with similarly shrunken and faded material to help hide the mend.
- If new fabric must be used to patch a washed and shrunken garment, shrink the patch; otherwise, the finished patch may not lie flat after laundering.
- On a ready-made garment, patch material can usually be taken from a facing, hem, pocket, sash, or from underneath the collar or cuffs. If patching fabric cannot be obtained from such areas, match the fabric as closely as possible in color, texture, and weight.
- If the fabric has a design, slide the patch material beneath the hole until the pattern matches. In a fabric with an up-and-down pile or nap such as corduroy, match the direction of the pile or nap. Careful matching helps hide a patch.
- When cutting patches, cut with the grain of the fabric making sure that lengthwise and crosswise yarns match those in the fabric being repaired.

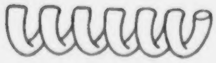
Ready-cut patches are available in several fabrics including denim, broadcloth, corduroy, and soft knits. These patches are cut to a specified size and can be used to repair holes or worn spots in garments. They can be applied by hand or machine sewing. In choosing the type of patch to use, the fabric construction, texture, and color should be considered. Woven fabric patches are usually more appropriate for use in repairing items such as jeans and sport coats. Some decorative patches are made in special shapes and in contrasting colors or textures. These patches are sometimes called ***appliqués***. An appliqué can serve as both a trim and a patch. Appliqués should complement the fabric weight, color, and texture used to construct the garment.

Repairing and Reinserting Zippers

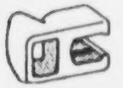
The ***zipper*** is a widely-used fastening device for women's, men's, and children's garments. Heavy wear, improper care, and frequent laundering or dry cleaning can damage a zipper or affect the way it functions. Employees in alteration departments of dry cleaners and retail stores often repair and replace damaged zippers.

When altering the waistline or side seam in a garment, it is often necessary to remove a zipper and reinsert it. If this process is necessary, the construction method used by the manufacturer should be observed carefully before removing the zipper. The same method used by the manufacturer should be used to reinsert the zipper in the garment.

The three types of zippers are conventional or regulation, separating, and invisible. Various sizes, weights, and colors of zippers are available. The ***conventional zipper*** or ***regulation zipper*** is closed at one or both ends. It is concealed under garment seam folds or placed in a slashed opening. The ***separating zipper*** is open at both ends allowing the zipper to disconnect completely. It can be concealed beneath seam folds or used as a decorative zipper so that it shows on the right side of the garment. The ***invisible zipper*** is a self-concealing zipper, closed at one end, and applied to the seam line with no visible means of stitching.


Coil

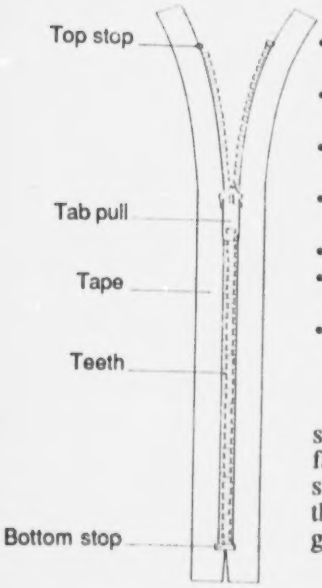
Each type of zipper is applied by hand stitching or with a special ***zipper foot*** that is attached to the sewing machine. A ***coil-constructed zipper*** is a continuous strand (monofilament coil) of nylon or polyester twisted into a spiral and attached to a tape made of manufactured fiber(s). Coil-constructed zippers have a self-healing feature that allows them, when jammed by entangled threads, fabric, or other material, to be repaired. The repair is done by folding the zipper lengthwise, grasping it between thumb and forefinger, and twisting sharply. The zipper coils disengage and allow the material to be removed. When the slider is moved to the bottom of the zipper and up to the top, the zipper becomes functional.


Metal scoop

The ***chain-constructed zipper*** is made of individual teeth, called metal scoops, that are constructed of aluminum or brass. The metal scoops are attached to a tape made of cotton or cotton blended with another fiber. Zippers made of monofilament coils are more flexible and lighter in weight than chain-constructed zippers.

Measurements used in directions for inserting zippers refer to the length of the teeth or coil, not the length of the zipper tape. Several terms related to zippers are defined below.

- ***tape*** – the zipper fabric
- ***teeth*** – metal or plastic parts attached to the zipper tape on a chain-constructed zipper
- ***coil*** – a continuous strand of polyester or nylon used in place of metal teeth for a more flexible and lightweight zipper
- ***tab pull*** or ***slider*** – the metal tab that glides over the teeth or coil to open and close the zipper
- ***bottom stop*** – metal bar placed over the teeth or coil at the bottom of the zipper to stop the slider
- ***top stop*** – metal bar placed on one side of the tape at the top of the zipper teeth or coil to stop the slider
- ***overlap*** – the fold of garment fabric extending over the zipper chain
- ***underlap*** – the opposite side of the overlap on a garment to which the other side of the zipper is stitched
- ***placket*** – a partial opening in a garment in an area such as the neckline, waistline, or sleeve

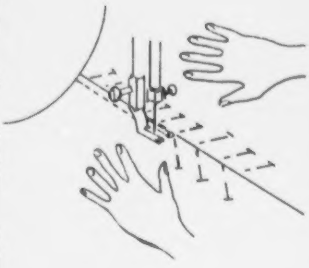


Before replacing a broken zipper or making alterations in the zipper area, the stitching that holds the zipper should be removed. The waistband or neckline facing is opened far enough to remove the zipper. If the seam edge is frayed, a strip of cloth or tape is added. The zipper is backstitched or machine stitched on the side of the opening that will lap over to cover the zipper on the outside of the garment.

The commercial method for reinserting a zipper in either the side seam or center back of a garment is easy and provides a smooth line. For the commercial method, the following guidelines may be used:

- Stitch the seam the length of the zipper teeth or coil using a machine basting stitch.
- Press the seam open and remove the basting stitches.

- Close the zipper and place the fold of the front seam allowance over the zipper teeth or coil making sure to cover the teeth or coil.
- Pin the zipper in place, starting at the top and working to the bottom of the zipper. Place pins diagonally about 1" apart with the points toward the seam line.
- Pin the back fold of the garment directly against the zipper teeth or coil at the bottom of the zipper.
- Use a zipper foot, a special sewing machine attachment, to stitch the zipper. Open the zipper about 1" and begin stitching 1/2" from the fold on the garment. Remove the pins as the presser foot reaches them to prevent puckers in the stitching line.
- After stitching about 1"z from the top of the zipper, stop the machine. Leaving the needle in the fabric, raise the presser foot and push the tab pull to the top stop of the zipper.
- Continue sewing with a straight line of stitching.
- Stitch to the bottom of the zipper, pivot, and stitch across the bottom of the zipper.
- Pivot at the edge of the fold and continue stitching to the top of the zipper. Stitch as closely as possible to the fold. The presser foot will glide on top of the closed zipper teeth while this line of stitching is being made.
- Open the zipper when the needle is about 1 1/2" from the top to allow a straight line of stitching past the tab pull. It may be necessary to lift the needle to provide space for sliding the tab pull. If this is done, reinsert the needle in the same place it originally was, and continue stitching to the top of the opening.



A ***fly front zipper insertion*** is one in which the zipper tape is double stitched to a facing that is then turned back and stitched a measured distance from the folded edge. A lap is produced that conceals the other half of the zipper which is stitched to an underlay extending beyond the center front line. The fly front opening usually laps from right to left in women's pants and always laps from left to right in men's pants.

The following procedures may be used to reinsert and repair zippers in the fly front of pants, slacks, or jeans. Illustrations of these steps are included in figure 9.13. Following these steps will result in a fly front zipper application with a left to right lap. For a right to left lap, the sides should be reversed while following the same procedures.

- Do not remove stitches below the bottom of the placket when removing the old zipper from the fly front of trousers, slacks, or jeans. Do not remove the crosswise stitching at the bottom of the placket. This stitching keeps the bottom of the placket strong. Remove stitches from the left side of the placket to loosen the facing.
- Place the closed zipper between the fold and the shield with the pants turned to the outside. Make sure that the bottom of the zipper is even with the bottom of the opening. (See step A of figure 9.13.)
- Pin the extra zipper tape that extends past the top edge in place. Hand backstitch or machine stitch along the old stitching line by starting at the bottom of the zipper. (See step A of figure 9.13.)
- Open the zipper and mark both sides of the zipper 1/2" above the waistline seam. Cut off the zipper at the marks. (See step B of figure 9.13.)
- Sew the waistband back in place where the zipper was stitched, following the old line of stitching. (See step C of figure 9.13.)
- Close the zipper and place the top side of the fly placket over the zipper. Pin and baste the zipper down so the fly will lie flat. (See step D of figure 9.13.)
- Open the facing to the inside of the pants and pin the loose edge of the zipper tape to the facing only. (See step E of figure 9.13.)
- Turn the pants to the outside and remove the basting that holds down the fly.
- Open the zipper and hand backstitch or machine stitch the zipper tape to the facing with two rows of stitching (1/4" apart). (See step F of figure 9.13.)

- Pin the facing in place and hand backstitch or machine stitch along the original stitching line, starting at the bottom. (See step G of figure 9.13.)
- Sew the waistband back in place. (See step H of figure 9.13.)

Fly Front Zipper Insertion

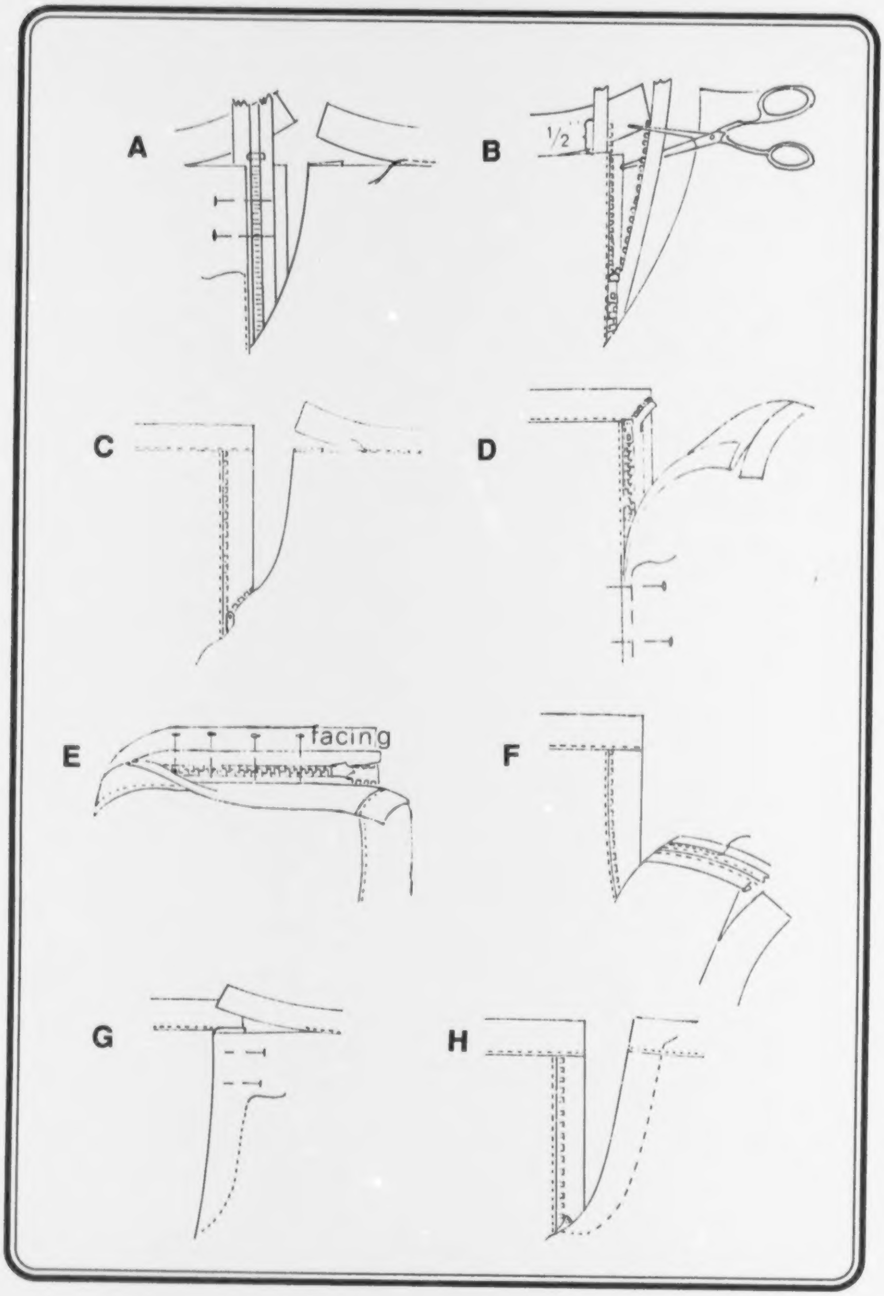
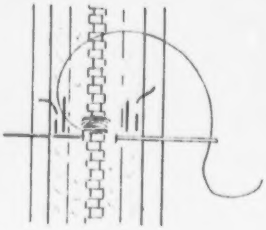


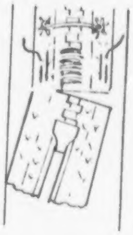
Figure 9.13

To save time, a regular presser foot is sometimes used to reinsert zippers instead of stopping to attach a zipper foot. Some alterations departments or businesses keep bottom stops for zippers that can be applied quickly with pliers. A bottom stop can be used to shorten a zipper without affecting the top stop. Zipper repair kits are available from supply companies. These kits include items such as metal bottom stops, tab pulls, zipper teeth, and special tools to attach zipper parts.



Zippers are available in almost any length. Sometimes a zipper length that is not available is required for a particular garment style. Zippers can be shortened from the bottom or the top. Separating zippers are usually shortened from the top. The following procedures are sometimes used to shorten zippers from the bottom:

- Choose a method of application and baste the zipper to the garment.
- Whip stitch across the zipper coil several times 1/4" below the desired end of the zipper opening.
- Sew a large, straight metal eye for a new bottom stop above the whip stitches.
- Cut off the extra zipper tape and teeth below the whip stitches and 1/2" below the new bottom stop.
- Complete the zipper application.



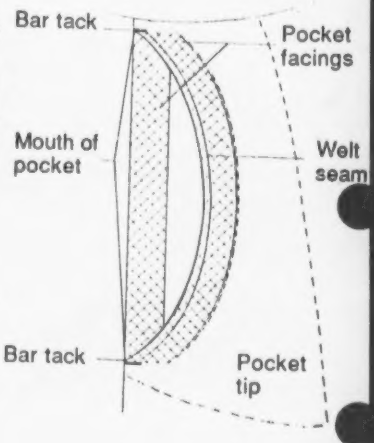
The following procedures should be followed when shortening a zipper from the top:

- Baste the zipper to the garment to within 1" of the desired end of the zipper teeth (at the top of the zipper).
- Open the zipper and remove the extra teeth from the zipper tape.
- Use two straight metal eyes for new top stops. Bend the metal eyes in half around each side of the zipper tape above the teeth. Sew the new top stop to the tape.
- Close the zipper. Fold the top ends of the zipper tape down before completing the zipper application. Trim off the extra zipper tape. Tack the tape ends down.
- Complete the zipper application.

After inserting a zipper, the placket area is pressed from the inside, using a press cloth. On the outside, a press cloth is used and brown paper is placed between the placket lap and the garment.

Repairing and Replacing Seam Pockets

Seam pockets, especially those in men's pants, often wear out before the rest of the garment. A ***seam pocket*** is a pocket sewn into the side seam or the side front seam of a garment. Seam pockets are used in skirts, slacks or pants, shorts, and dresses. The type of repair required is determined by observing how worn the pockets are. If only the bottom of the pocket is worn, only part of the pocket should be replaced. This procedures is sometimes referred to as replacing a half pocket. However, if the entire pocket is worn, a new pocket must be inserted in the garment.



The following terms are related to pocket replacement procedures:

- ***pocket tip*** – the bottom part of the pocket
- ***pocket bag*** – two pieces of fabric sewn together to form the inside of a seam pocket
- ***mouth of pocket*** – the opening of the pocket
- ***pocket facings*** – the facings that are located at the mouth of the pocket and are made from the same fabric as the garment.
- ***welt seam of pocket*** – a strengthening stitch at the top of the mouth of the pocket; sometimes called lapped seam or topstitched seam
- ***bar tack*** – stitching at the top and bottom of the pocket's mouth that reinforces the opening

The following steps may be used to replace a half pocket in a garment. Illustrations of these steps are included in figure 9.14.

- Cut off the lower half of the pocket.
- Rip the seam out in the part of the pocket that has been removed. Using this part of the pocket as a pattern, cut a new pocket half, allowing at least 1" to 1 1/2" of extra fabric across the top for a seam. (See step A of figure 9.14.)
- Attach the new half pocket to the top half of the original pocket using a flat-felled seam. Make a French seam at the bottom of the pocket for reinforcement. (See step B of figure 9.14.)

Attaching a Half Pocket

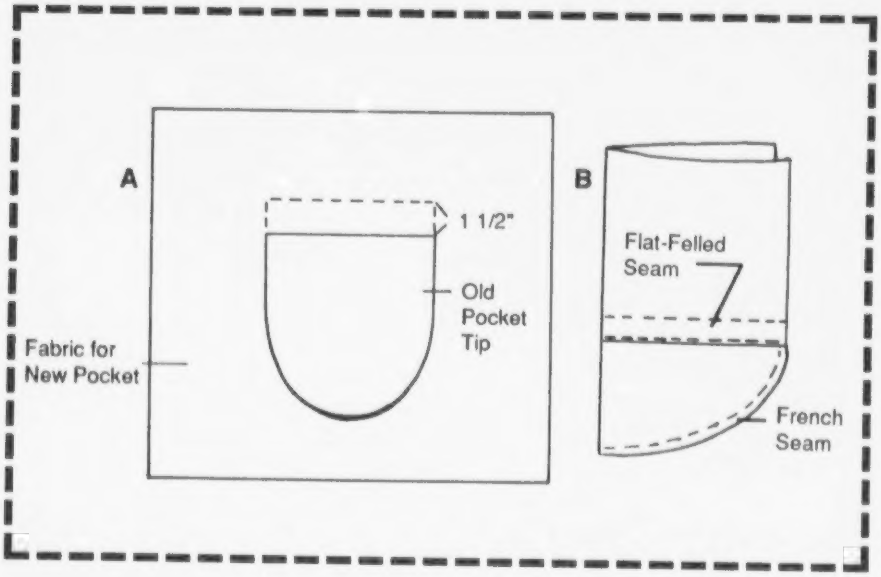


Figure 9.14

There are various ways to replace an entire seam pocket in a garment. As with any other repair method, it is important to follow the procedures used by the alteration department or business for which one is employed. The following steps describe one method for replacement of a seam pocket. Illustrations of the procedures are included in figure 9.15.

- Look carefully at the construction of the pocket before ripping any part of the pocket. Remove any belt loops. Remove stitches that attach the waistband facing to the waistline far enough to reach the pocket. (See step A of figure 9.15.)
- Remove stitches holding the side of the pocket in place. Rip out the seam on the pocket sides and bottom. (See step B of figure 9.15.)
- Remove stitches that attach the pocket facing to the top side of the pocket. (See step C of figure 9.15.) If bar tacks at the bottom and top of the pocket are sewn through the pocket, cut around them; do not remove them. When the stitches attaching the pocket facing to the pocket are removed, the pocket will open up as shown in step D of figure 9.15.
- Cut the pocket out of the garment, beginning 1/2" beyond the edge of the pocket facing. Cut flush with the bottom of the facing at the lower edge. (See step E of figure 9.15.)
- Cut a new pocket using the old pocket as a pattern. Allow an additional 1 1/2" on the side of the pocket that was cut from the garment. (See step F of figure 9.15.)

Replacing a Seam Pocket

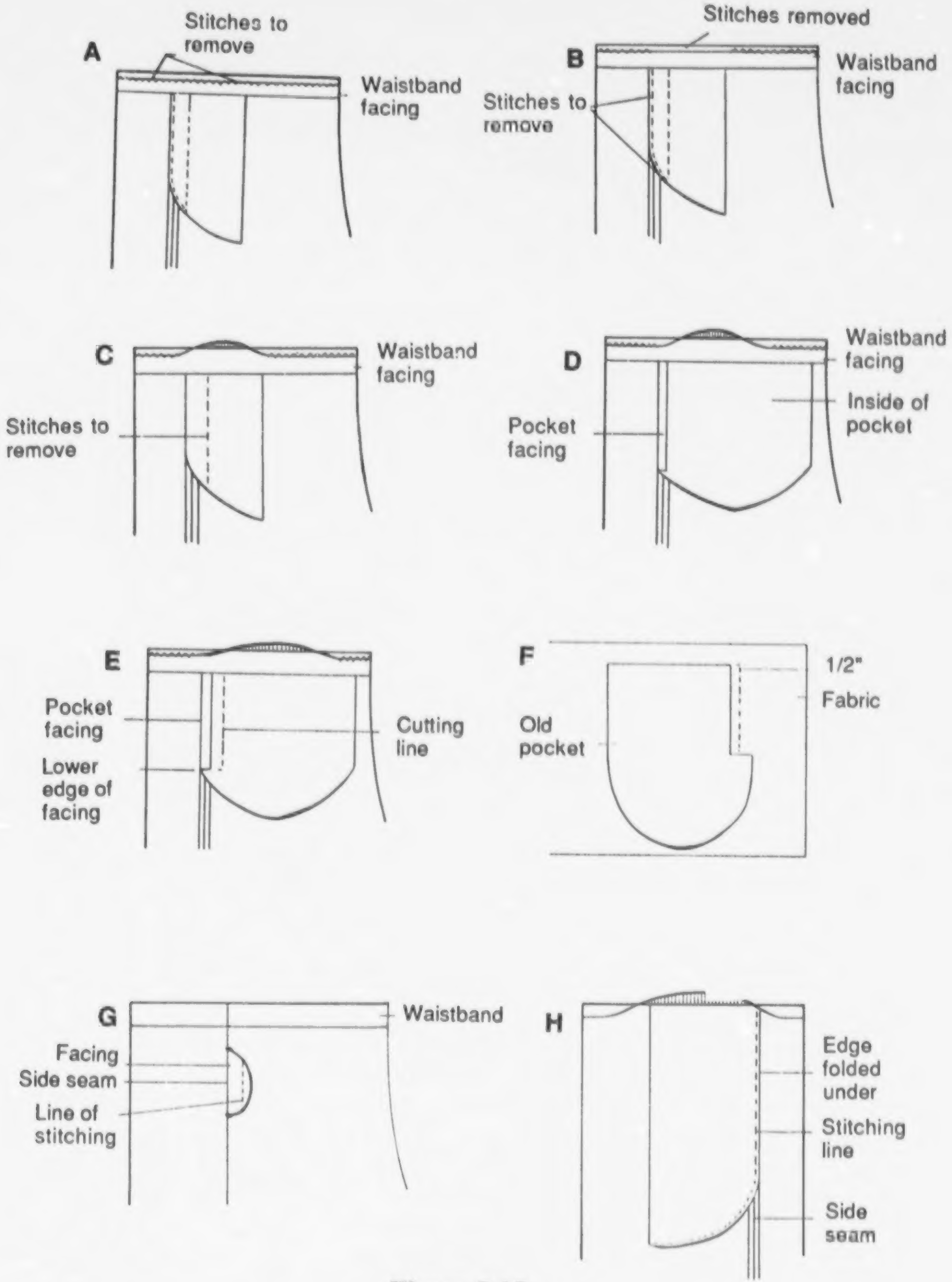


Figure 9.15

- With right sides together, stitch the side of the new pocket with the 1/2" allowance to the 1/2" extension of the old pocket. Use a 1/2" seam. This step results in a seam allowance on the outside of the pocket.
- Fold the pocket in half with the wrong sides together and stitch a 1/4" seam at the bottom of the pocket. This step results in the seam allowance being on the

inside of the pocket. Turn the pocket inside out.

- Topstitch the facing to the pocket as it was originally on the right side of the garment. (See step G of figure 9.15.)
- On the wrong side of the garment, fold under the lengthwise edge of the top pocket side. Stitch the edge of the pocket to the side seam allowance. Make a French seam on the bottom of the pocket. (See step H of figure 9.15.)
- Attach the top of the pocket to the waistband as it was originally.

BASIC PRESSING TECHNIQUES

Heat, moisture, and pressure are the three essential ingredients needed to press most fabrics. The amount of each ingredient varies with different types of fabrics. Too much heat can damage fabric and cause shine; therefore, using the correct temperature is important when pressing. Moisture is also needed for pressing most fabrics; in some cases, moisture can cause spots, change texture, or give an overpressed look.

Pressure should usually be applied lightly when pressing. Some wools may require application of more pressure than other fabrics. A pounding block or clapper is used on such fabrics to flatten any areas that require extra pressure. An important rule to remember is that pressing is not the same as ironing. ***Pressing*** involves lifting the iron and setting it down, not pushing the iron.

The following rules should be used to determine the pressing requirements of specific fabrics:

- Test before pressing. The effects of pressure and heat should be tested on a fabric scrap or in a less noticeable area to determine the best technique for the fabric. The results should be compared with an unpressed area.
- Check the fabric's reaction to steam and moisture. Do not use too much of either steam or moisture.
- Press on the wrong side of the fabric when possible. When it is necessary to press on the right side of the fabric, use a press cloth.
- Become familiar with the characteristics of different fabrics and avoid over pressing.

Pressing is as important as stitching in apparel construction. In the textiles and apparel industries, the presser is a skilled technician. A ***presser*** is an employee who presses garment details while garments are being constructed or presses constructed garments that have been laundered or dry cleaned. To get a professional look in garments being constructed, the presser must press each construction line before a sewer crosses it with another seam. Pressing is also very important during the alteration of a garment. It is impossible to construct a garment that has a professional appearance if pressing is not done during the construction process.

Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Apparel manufacturers and dry cleaners use commercial pressing equipment that is especially designed for different pressing tasks. For example, when shaping fabric is fused to a jacket front in an apparel manufacturing plant, a buck, a convex shaped pressing surface, may be used. A second concave pressing surface known as a hot head is brought down and held on the fabrics to permanently fuse the fabrics together. Many custom sewers and alteration businesses use conventional pressing equipment that is commonly used in home sewing. Although equipment may vary according to the employment situation, the same basic pressing techniques are used.

The three pressing methods are dry pressing, wet pressing, and steam pressing. To ***dry press,*** the garment is pressed on the wrong side without a cloth.

Lightweight fabrics of rayon, cotton, and silk are usually dry pressed. To ***wet press,*** a damp press cloth is placed over the fabric and a dry iron is used. To ***steam press,*** a steam iron is used with or without a press cloth.

The following guidelines will help pressers and garment makers use pressing techniques effectively during construction:

- Set up pressing equipment near the sewing machine during garment construction or alteration if conventional pressing equipment is used and if one person performs pressing and stitching tasks.
- Use appropriate pressing equipment for each task.
- Use steam to ease, flatten seams, and mold curves. Use heat and moisture, not weight, to shape garments.
- Avoid pressing lengthwise creases in sleeves or lapels.
- Press collars, lapels, cuffs, belts, and pockets on the wrong side first; finish by pressing lightly on the right side while using a press cloth.
- Press embroidery, braid, buttons, and other rough textures from the wrong side over a soft pad such as a folded towel.

Pressing Construction Details

Seams that require clipping or notching should be clipped or notched before they are pressed. A seam is first pressed in the same direction it is stitched. Then, the seam is pressed open. Straight seams are pressed on an ironing board, seam roll, needle board, or press table. Curved seams are pressed on a tailor's ham, press mit, tailor's board, or specialized pressing equipment with shaped surfaces.

Darts are extended outward and pressed flat immediately after they are stitched. Then, each dart is pressed in the direction the dart will be positioned in the finished garment. Vertical darts are pressed toward the center of the garment. Horizontal darts are pressed downward. Deep or bulky darts are trimmed and slashed in the centers first; then, they are pressed open. Corners or points may be pressed in several ways. To press corners on a finished edge, the garment section is laid over a point presser. The seam is opened with the tip of the iron. Figure 9.16 illustrates basic techniques used in pressing darts.

Pleats are pinned and basted in the appropriate direction before pressing them. A press cloth is used to press pleats. The entire garment should be supported while pressing pleats to avoid pulling the pleats out of place. Soft pleats should be lightly pressed. Steam is used to set the creases in sharp pleats. Using a damp press cloth placed over the pleats during pressing results in sharper pleats.

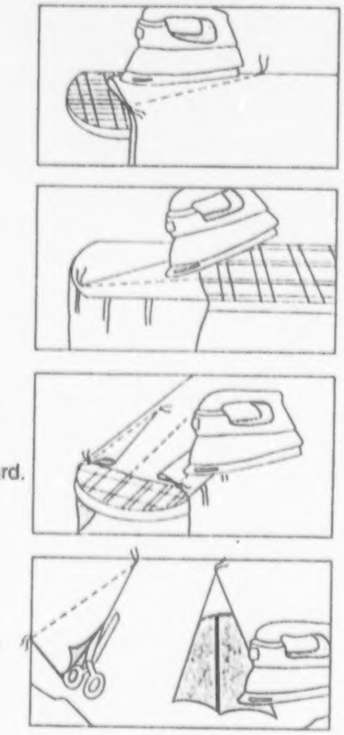
After pressing a section of pleats, the pleats should be allowed to dry thoroughly before moving them off the ironing board or press table. Pleats are pressed on the right side of the garment first; then, they are pressed on the wrong side. A press cloth is used on both sides. To remove unwanted ridges that may be formed by pressing, strips of heavy paper are placed beneath each fold and the pleats are pressed again. The basting that holds the pleats during pressing are left in the garment as long as possible to help maintain the folds.

Tucks are first pressed from the underneath side of the folds. Using too much steam may result in puckering. Heavy paper should be placed under the folds of wide tucks. A press cloth is used when pressing tucks from the right side.

Ease or fullness may be shrunk out of an area by holding the side of the iron parallel to and a few inches away from the stitching line. The iron is moved across the fullness all the way to the seam line. This method is least effective when used with fabric made from manufactured fiber(s).

To press gathers or shirring, the gathered or shirred item is held firmly at the stitching line with one hand. The point of the iron is guided toward the gathers or shirring with the other hand. Gathers or shirring should be pressed from the wrong side when possible. The heat should be reduced to prevent scorching.

Techniques for Pressing Darts



Press dart flat. Do not press beyond point of dart.

Place dart, wrong side up, over tailor's ham or end of ironing board to keep contour of fabric.

Press vertical darts toward center of garment. Press horizontal darts downward. Press diagonal darts downward.

For darts in heavy fabric, cut dart open to within one inch of point. Press dart open.

Figure 9.16

Plackets and zippers are pressed according to the shape of the surrounding garment area. The placket is positioned right side down over a press pad or a tailor's ham. A press cloth and limited moisture are used to prevent puckers. It is best to avoid pressing directly on zipper teeth or coils, hooks and eyes, or snaps. This prevents damage to the items or to the soleplate (bottom) of the iron.

Bound buttonholes should be pressed at several points during construction. Bound buttonholes are pressed from both the right and wrong sides of the garment. Heavy paper is placed between the buttonhole strips and the garment before pressing to prevent creating imprints on the right side.

The same pressing techniques used to press buttonholes should be used to press pockets. After the pocket is stitched to the garment, the pocket is pressed from the right side using a press cloth. For welt or flap pockets, heavy paper is placed between the garment and the welt or flap. After pressing from the right side, the garment is turned to the wrong side. The garment and pocket are pressed along seam lines using a press pad. If the bottom portion of the pocket is not attached on the inside of the garment, the pocket should be raised in order to press the portion of the garment underneath the pocket.

During construction, hems are pressed lightly to shrink out excess fullness and to make the hem fold. It is important to check hem seam lines and the grain line of the hem allowance. These hem seam lines and the hem grain line should line up with the garment's seam lines and grain line. Heavy paper should be inserted in the hem fold to prevent a ridge from forming on the outer fabric during pressing. After the hem is stitched, it is pressed a second time using a damp press cloth. The iron's point is positioned perpendicular to the hem and toward the garment. The iron is placed on a portion of the hem, lifted, and placed on another portion of the hem until the entire hem has been pressed.

Final Pressing

Final pressing should only involve touching up if thorough pressing is done during construction or alteration. Final pressing is done to remove wrinkles that come from handling the garment and to touch up edges. The amount of final pressing required depends on the quality of pressing done and care taken during construction or alteration.

Pressing is an important part of the alteration procedures used in retail stores, alteration businesses, and dry cleaners. The customer expects the garment to be ready to wear after alterations are made. After pressing, the garment should be checked to ensure that the desired effect has been achieved without changing the appearance of the garment. When alterations have been performed properly, the garment should satisfy the customer.

Most final pressing is done to the right side of the entire garment; however, it can be limited to the area in which an alteration or repair is made. The rules for using moisture, pressure, and heat during final pressing should be followed and a press cloth should be used when needed.

The following steps should be used when completing the final pressing of a garment:

- Press inside construction details such as pockets, facings, seams, linings, and shoulder pads, if needed.
- Press the collar carefully since it frames the face.
- Press parts that extend from the body of the garment such as sleeves and sashes.
- Press ruffles and gathers before pressing the parts they trim.
- Press yokes and shoulders before the lower shirt, blouse, or bodice.
- Press the top parts of long garments before pressing the lower parts. For example, press the bodice before the skirt, the skirt top before the lower part of the skirt, and the pants top before the pants legs.
- Hang the garment on a well-padded hanger. Close the zipper and button buttons where necessary to hold the garment on perfect grain. If necessary, pad curves such as those in sleeves and collars with tissue paper to help them keep their shapes. Allow the garment to dry completely without crowding it before storing.

The following suggestions may also be helpful in final pressing:

- Press in the same direction as the grain of the fabric.
- Press with the zipper closed. If the zipper is in a curved area of the garment, press with the curve over a cushion.
- Press thick areas (such as collars and belts) on the wrong side first until they are smooth but not dry. Finish pressing with the right side out.
- Use a tailor's ham for pressing the collar and lapel. Press carefully on the lengthwise grain of the collar.
- Do not press creases in sleeves. Use a sleeve roll or magazine inside the sleeve to aid in pressing.
- Press the hem of the garment with the grain of the fabric
- Have wool and tailored garments professionally pressed as needed.

Pressing takes time, patience, experience, proper equipment, and knowledge about grain line, various fabrics, and the contours of garments. A good garment maker cannot produce a professional-looking, high-quality garment without being able to press effectively. In addition, alterationists, laundries, and dry cleaners must use proper pressing procedures for quality service to be achieved.

Points to Remember

- Good work methods involve using the principles of motion economy in order to save time and be more efficient.
- Good machine control means the operator can start, stop, and sew at the speed desired. In addition, good machine control involves feeding materials through the machine evenly to accomplish assigned tasks.
- Skipped stitches and breaking thread are often caused by faulty sewing machine threading. It is important to follow correct threading procedures so that the machine operates properly.
- Different types of stitching are accomplished using different sewing machines. Choice of stitching depends on various factors including design and style of the garment, type and weight of the fabric selected, care of the garment, method of construction, and the quantity of garments produced.
- Sewing machine operators must learn to position work, follow straight and curved lines, turn corners, start and finish seams, and back tack or backstitch before beginning an actual sewing operation.
- Basic sewing techniques include backstitching; staystitching; basting; understitching; topstitching, sewing corners, points, and inserts; feeding uneven plies; and sewing darts, pleats, tucks, and buttonholes.
- When a straight seam is completed, plies should come out the same length with edges even, seams should be sewn the required width, and seams should not pucker. Trimming, grading, clipping, and notching are used on various types of seams.
- Types of seams include the welt seam, French seam, flat-felled seam, and double-stitched seam.
- Seam finishes are techniques used to make seam allowances look neater and prevent edges from raveling. Seam finishes include the zigzag seam finish, hand-overcast seam finish, pinked seam finish, pinked and stitched seam finish, and clean finished seam.
- Hand stitches are made with a hand needle and include basting, the backstitch, catch stitch, slip stitch, blanket stitch, buttonhole stitch, thread chain, vertical hemming stitch, blind-hemming stitch, overcast stitch, running stitch, padding stitch, French tacks, and tailor's tacks.
- When customers purchase clothing or have garments cleaned, they expect them to be in good condition. Garment repair is done at many retail stores, alteration businesses, and dry cleaners.
- Garment repairs that are commonly done include repairs to buttons, buttonholes, snaps, hooks and eyes, rips, seams, zippers, and pockets. Repair procedures commonly used include darning, patching, and seam reinforcement.
- Pressing involves lifting the iron and setting it down, not pushing the iron. Heat, moisture, and pressure are the three essential ingredients for pressing most fabrics.
- Three pressing methods exist. They are dry pressing, wet pressing, and steam pressing.
- Final pressing should only involve touching up if thorough pressing is done during construction or alteration.

Words to Know

- appliqués
- backstitch
- backstitching
- back tacking
- bar tack
- basting
- blanket stitch
- blind-hemming stitches
- blind slipstitch
- bottom stop
- buttonhole stitch
- catchstitch
- chain-constructed zipper
- clean finished seam
- clipping
- coil
- coil-constructed zipper
- composite garments
- contour dart
- conventional zipper
- corner
- cross-feeding
- darning
- darts
- double-pointed dart
- double-stitched seam
- draped garments
- dry press
- eased seam
- edgestitching
- even basting stitches
- finish stitching
- fit
- fitted garment
- flat-felled seam
- fly front zipper insertion
- French seam
- French tacks
- garment construction
- garment repair
- gathered seam
- grading
- hand-overcast seam finish
- hand stitches
- hemming stitches
- inserts
- invisible zipper
- lock stitch
- machine basting
- machine control
- mock French seam
- motion economy
- mouth of pocket
- notching
- overcast stitch
- overlap
- padding stitches
- patching
- pattern darn
- pinked and stitched seam finish
- pinked seam finish
- pivoting
- placket
- pleats
- pocket bag
- pocket facings
- pocket tip
- point
- presser
- pressing
- regulation zipper
- running stitches
- seam
- seam finishes
- seam guides
- seam pocket
- separating zipper
- shank
- single-pointed dart
- slider
- slipstitch
- standard dart
- staystitching
- steam press
- stitch
- straight seam
- surface stitching
- tab pull
- tailored garments
- tailor's tacks
- tape
- teeth
- thread chains
- topstitching
- top stop
- trimming
- tucks
- underlap
- understitching
- uneven basting stitches
- vertical hemming stitch
- welt seam
- welt seam of pocket
- wet press
- zigzag seam finish
- zipper
- zipper foot

Questions for Review

1. What are five principles of motion economy as applied to sewing, repairing, and pressing garments?
2. What does having good machine control mean?
3. How is the type of stitching chosen for a particular garment or a specific sewing task?
4. What are five characteristics of good machine stitching?
5. How is staystitching used in apparel construction? What is the difference in staystitching and understitching?
6. What are the differences in standard darts and double-pointed darts?
7. In what situations are seams trimmed? graded? notched? clipped?
8. What are the differences in French seams, welt seams, flat-felled seams, and double-stitched seams?
9. What are three methods of holding work for hand sewing tasks?
10. What are five different types of hand stitches? How are each of these stitches made?
11. What are three suggestions for making hand or machine darns that are hardly visible?
12. When is it best to patch a garment rather than darn it?
13. What is the difference in a coil-constructed zipper and a chain-constructed zipper?
14. What is the correct procedure for shortening a zipper from the bottom? from the top?
15. What are the three essential ingredients for pressing most fabrics? What is the difference in pressing and ironing?
16. What are five suggestions for final pressing of a garment?

10

Measuring for Custom-Made Garments

ESSENTIAL ELEMENT

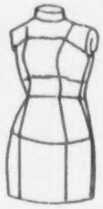
- Apply appropriate procedures when measuring for custom garment.(q4A)

OBJECTIVES TO ACHIEVE

- Summarize factors to consider when measuring for custom garments.
- Identify various measuring tools used for apparel construction and their major functions.
- Demonstrate the correct procedures for measuring the human body.
- Determine the figure types for females, males, and children.
- Describe the methods used to select pattern size.
- Analyze the uses and functions of the pattern envelope.

As described in Chapter Two, tailors, dressmakers, and custom sewers are people who construct garments according to customer specifications. In the clothing design business, sample makers construct sample garments from muslin (a plain-woven fabric made from bleached or unbleached carded yarns) using designers' sketches. Most custom sewers use commercial patterns to construct garments. ***Commercial patterns*** are produced by pattern companies and sold in fabric stores and fabric departments. Consumers use these patterns to construct garments according to their own preferences. These patterns are made according to general specifications of each particular pattern company and may have to be altered (adjusted) for each customer.

Different methods are used to construct patterns. ***Pattern drafting*** is a system of pattern making that depends on a series of form or figure measurements to make a paper pattern. ***Pattern draping*** is a process that involves draping a two-dimensional piece of fabric to fit a form or figure's shape in order to create a three-dimensional fabric pattern. A ***form*** is a standardized duplication of a human torso. The form may also be called an industrial form, a model form, or a dress form. Muslin is used to construct the draped pattern on the form or live model. The draped pattern is then transferred to paper, corrected, and used to make a final pattern. Pattern companies use both drafting and draping to develop patterns. Apparel manufacturers and designers also use these methods to construct ***production patterns***, the final patterns used in manufacturing ready-made garments.



The form can be a valuable tool in the construction of custom-made garments. Forms vary in design. In addition to their widespread use in creating patterns for apparel manufacturing, they are used in making custom garments for the following purposes:

- developing original patterns
- fitting sample garments
- altering custom-made garments
- establishing the hemlines of garments

When constructing a custom-made garment, either the pattern or the fabric can serve as an inspiration for the garment. Usually, the pattern is selected first. There are many pattern styles available. Not every pattern style looks equally good on all body types, just as various styles of ready-made garments look different on people of various sizes and shapes. The success of a finished garment depends on the selection of a pattern in the correct figure type and size.

FACTORS TO CONSIDER WHEN MEASURING

Many factors must be considered before a commercial pattern is selected. These factors include the purpose of the garment, influence on current fashion, influence of the elements and principles of design, kind of fabric, figure type, and pattern size. These factors are usually considered by the consumer when shopping decisions are made. However, being aware of the decisions a customer must make can assist the custom sewer, dressmaker, or tailor in developing a good working relationship with the client.

Taking measurements saves time during garment construction if done accurately. Accurate measuring can only be done if concentration and patience are used throughout the measuring process. It is important to note that some clients have asymmetrical figures. An ***asymmetrical figure*** is one with different measurements on one side of the body than the other side. Actually, most human figures differ to some degree from side to side. For example, one shoulder may be higher than the other shoulder. Such figure differences affect the way clothes hang on the body. If accurate measurements are not taken initially, garments may not fit well in certain areas or hemlines may tilt upward or downward.

In order to record exact measurements, the custom sewer should make a personal measurement chart for each client. Figure 10.1 provides an example of a ***personal measurement chart*** used to record body measurements that are vital to the pattern selection and alteration processes. The example provided is for use in recording a woman's body measurements. Personal measurement charts should also be used when custom sewing for men and children.

The example chart in figure 10.1 includes spaces to record measurements taken in a variety of figure locations. The pattern size selected is determined by exact body measurements. However, the garment made from the pattern is larger than the exact body measurements. A small amount of room is added to the body measurements to allow the person to move easily when wearing the garment. ***Ease*** is the difference between the body measurement and the garment measurement at a given point. Note that different amounts of ease are allowed for different parts of the garment. The chart in figure 10.1 provides a space to total each body measurement plus the additional ease allowed. This process allows the custom sewer to calculate how large the pattern should actually be in order to fit the client.

Personal Measurement Chart
(Female)

Client Name ____________________ Figure Type ____________________
Date ____________________ Pattern Size ____________________

Measurement Location		Body Measurement	Ease to Add	Total	Pattern Measurement	Alteration Needed
Bust			3" – 4"			
Chest			0"			
Waistline			1/2" – 1"			
Hips	3" below waist		1/2" – 1"			
	7" below waist		2"			
	9" below waist		2"			
Shoulder Length			0"			
Back Width	Upper		0"			
	5" below neck		1"			
Bodice Lengths	Center front		1"			
	Shoulder to bust point		0"			
	Bust point to waist		1/2"			
	Center back		1/2"			
	Over shoulder blade		1/2"			
Arm (Sleeve)	Shoulder to elbow		1/2"			
	Shoulder to wrist		1/2"			
	Girth		2" – 3"			
	Wrist		1/2" – 1"			
Skirt Length	Center front		3" hem			
	Right side		3" hem			
	Center back		3" hem			
	Left side		3" hem			

Figure 10.1

Individuals employed to construct patterns for apparel manufacturers or fashion designers also record body measurements on measurement charts. However, these employees often measure forms rather than live models in order to construct patterns for garments to be manufactured. After a form is measured, a sloper is developed. A ***sloper***, also known as a ***basic pattern***, is a pattern of a garment component (such as a bodice or sleeve) without style lines or seam allowances. The sloper is developed from specific measurements of the form or a live model.

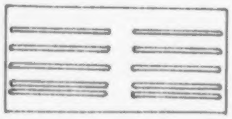
When measuring a client's body for a custom-made garment, it is important to revise the personal measurement chart when figure changes occur. This chart is very helpful in determining each client's pattern size. It can also be used when checking the pattern dimensions for adjustments and alterations.

MEASURING TOOLS

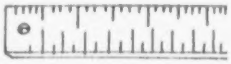
Good measuring tools are essential for achieving accurate fit in custom clothing, alterations, and apparel manufacturing. It is important to measure often and accurately in addition to rechecking measurements. A variety of measuring tools are needed by these employees. The following measuring tools are used to ensure proper fit and accurate sewing:

- tape measure – A ***tape measure*** is a narrow, firmly woven or plastic tape that is flexible. Most tape measures are sixty" long and are marked with measurements indicating both inches and metric terms. If each side of a tape measure is a different color, it is easy to tell whether the tape measure is twisted when taking body measurements. The tape measure used by tailors and alterationists of menswear has a special fiberboard piece on the end called a crotch piece. This special ***tape measure with a crotch piece*** is used to measure the inseam and outseam of men's pants.

- transparent ruler – A ***transparent ruler*** is usually 1" or 2" wide and has a clear, plastic, straight edge. Transparent rulers are available in 6", 12", and 18" lengths. A transparent ruler is imprinted with a grid in inches and fractions of inches the length and width of the ruler. A transparent ruler is most helpful when guidelines and marks must be seen through the ruler.

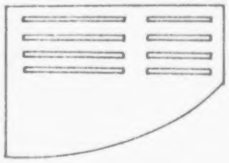


- measuring stick or yardstick – A ***measuring stick*** or ***yardstick*** is a 36", 40", or 45" wooden or metal straight-edged ruler with measurements marked in inches and/or metric terms. Some measuring sticks, called ***vertical rulers***, have numbers that are arranged to be read vertically.

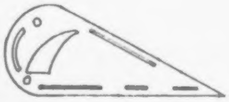


- ruler – ***Rulers*** are straight-edged strips of metal, wood, or plastic. They are marked with measurements usually indicating both inches and metric terms. Rulers are available in 6", 12", and 18" lengths for use in a variety of measuring tasks.
- sewing gauge – A ***sewing gauge*** is a short ruler that has an indicator slide that can be set at any point along the ruler. Sewing gauges are used in measuring short distances such as hems, in topstitching, and in other detailed work. A pliable 6" gauge is recommended.

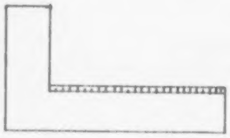
- automatic hem gauge or sleeve gauge – An ***automatic hem gauge*** or ***sleeve gauge*** is a 3"-by-5 1/2" rectangular guide with graduated markings from 1/4" to 2 1/2". This gauge is used to turn garment hems, sleeve hems, edges of pockets, and edges of appliqué designs. The gauge is placed on the fabric, the fabric is turned up the desired amount, and the item is pressed without having to pin.



- skirt marker or hem marker – A ***skirt marker*** or ***hem marker*** is a ruler attached to a weighted base. It is used to mark hems while a garment is on a form or on a human body. Some hem markers have an adjustable device that releases powdered chalk to mark hems by use of an attached pressure bulb and hose. Other hem markers have an adjustable clamp for inserting pins or marking hems with chalk.
- triangle – A ***triangle*** is a three-sided tool with two sides of equal length, meeting at an angle of ninety degrees. Each of the sides of equal length joins a third side at a forty-five degree angle. The triangle is used to mark corners and angles on patterns.
- French curve – A ***French curve*** or ***irregular curve*** is a guide shaped in a spiral curve that aids in altering patterns and in redrawing construction lines. French curves are usually about 10" in length.



- L square or tailor's square – An ***L square*** or ***tailor's square*** is a metal, wooden, or plastic ruler with two arms of different lengths meeting at right angles. The tailor's square is marked in inches and/or centimeters including fractional measurements. It is used for straightening grains, for altering tissue patterns, and for other marking tasks.



- sleigh curve – A ***sleigh curve*** is a metal or plastic drawing guide with an edge that includes a variety of curves. The sleigh curve is useful for marking and altering curved lines such as darts, necklines, rounded sleeve seams, and curved hemlines.

MEASURING THE HUMAN FIGURE

There are specific procedures to follow in measuring the human figure in order to make decisions regarding custom garments. When aligning the tape measure around the body, it should feel snug, but not tight. Measurements are more exact when taken by a person other than the individual being measured.

Ideally, the person being measured should stand barefoot on a flat, hard surface with feet slightly apart and weight evenly distributed. Smooth undergarments that are normally worn should be worn during the measuring process. If desired, the person may wear a close-fitting garment such as a body suit or leotard over undergarments. Bulky clothing items such as sweaters, belts, and loosely fitting jeans should be removed. Measurements should be taken between breathing so that the person maintains a natural, relaxed stance. To measure accurately, it is a common procedure to actually mark the body as each measurement is taken. Washable felt-tip pens are usually used for this purpose.

Measuring Women

A variety of measurements may be taken when choosing a commercial pattern, altering a pattern, or designing a pattern. When choosing a commercial pattern, the size selection is usually based on only a few measurements. The following list describes six basic measurements often used when selecting patterns:

- height – ***Height*** is measured by having the client stand in stocking feet with the back against a wall. The client's posture should be erect but natural. The person measuring should place a ruler on top of the client's head and perpendicular to the wall. A mark is made where the ruler touches the wall and a yardstick or tape measure is used to measure from the floor to the mark.
- back neck to waist or back waist length – The ***back neck to waist*** or ***back waist length*** measurement is secured by measuring from the most prominent bone at the base of the neck down to the the center back to the waistline. To locate the client's natural waistline, a string is placed around the middle portion of the client's body. When released, the string will move to the natural waistline area.
- chest or high bust – The ***chest*** or ***high bust*** measurement is obtained by measuring across the fullest part of the back, under the arms, and above the full bust line. The high bust measurement is not listed on most pattern envelopes. However, if there is a difference of 2" or more between the high bust and full bust measurements, the high bust measurement should be used in selecting the correct pattern size.
- bust or full bust – The ***bust*** or ***full bust*** measurement is taken by measuring across the fullest part of the back, under the arms, and across the full bust line.
- waist or waistline – The ***waist*** or ***waistline*** measurement is taken by measuring around the natural indentation at a person's waist with the tape measure parallel to the floor.
- full hip – The ***full hip*** measurement is usually taken by measuring around the fullest part of the hip area (usually 7" to 9" below the natural waist). The person measuring should note the distance from the waist that the hip measurement is taken.

When pattern alterations must be done, additional measurements are needed in order to make the garment fit the body. The measurements listed on the personal measurement chart in figure 10.1 for females are examples of measurements that are helpful in the pattern alteration process. In addition to these basic measurements, the following measurements may by used:

- 3" below waist – The ***abdomen*** or ***3" below waist*** measurement is taken by measuring around the body 3" below the waistline.
- 7" below waist – The ***7" below waist*** measurement is taken by measuring around the body 7" below the natural waistline.

- 9" below waist – The ***9" below waist*** measurement is taken by measuring around the body 9" below the natural waistline.
- shoulder length – The ***shoulder length*** measurement is obtained by measuring from the base of the neckline to the tip of the shoulder (shoulder bone).
- upper back width – The ***upper back width*** measurement is obtained by measuring across the back from the tip of one shoulder point (top of armhole) to the tip of the other shoulder.
- 5" below neck back width – The ***5" below neck back width*** measurement is obtained by measuring across the client's back 5" below the neckline at right angles to the center back measurement.
- center front bodice length – The ***center front bodice length*** measurement is obtained by measuring from the neckline to the natural waistline.
- shoulder to bust point bodice length – The ***shoulder to bust point bodice length*** measurement is taken by measuring from the middle of the shoulder to the bust point below the shoulder. The ***bust point*** is located at the point of the fullest area of the bust. The bust point on a pattern can be identified by intersecting an underarm dart to cross a dart projecting from the waistline toward the shoulder. The location where the two darts intersect is called the bust point.
- bust point to waist bodice length – The ***bust point to waist bodice length*** measurement is taken by measuring from the bust point to the waistline.
- center back bodice length – The ***center back bodice length*** measurement is obtained by measuring from the neckline to the waistline.
- over the shoulder blade bodice length – The ***over the shoulder blade bodice length*** measurement is taken by measuring from the middle of the shoulder to the waistline. The tape measure is kept parallel to the center back.
- shoulder to elbow – The ***shoulder to elbow*** measurement is obtained by measuring from the shoulder bone to the elbow with the client's arm slightly bent.
- shoulder to wrist or arm length – The ***shoulder to wrist*** or ***arm length*** measurement is taken by measuring from the shoulder bone to the wrist with the arm slightly bent.
- girth or arm circumference – The ***girth*** or ***arm circumference*** measurement is obtained by measuring the circumference of the arm beginning and ending about 1" below the armpit.
- wrist – The ***wrist*** measurement is secured by measuring the circumference of the wrist at the wrist bone.
- center front skirt length – The ***center front skirt length*** measurement is obtained by measuring from the natural waistline at the center front to the location where the lower edge of the garment ends.
- right side skirt length – The ***right side skirt length*** measurement is obtained by measuring from the natural waistline at the right side of the body to the location where the lower edge of the garment ends.
- center back skirt length – The ***center back skirt length*** measurement is taken by measuring from the natural waistline at the center back to the location where the lower edge of the garment ends.
- left side skirt length – The ***left side skirt length*** measurement is obtained by measuring from the natural waistline at the left side of the body to the location where the lower edge of the garment ends.

Other measurements may be required in order to custom sew specific types of garments. For example, two crotch measurements may be needed to construct a pair of women's slacks. The ***crotch depth*** measurement is obtained by having the client sit on a hard, flat chair and measuring from the natural side waistline to the chair seat. This measurement is also known as the ***rise***. The ***crotch length*** measurement is obtained by measuring from the center front waistline, under the crotch (between legs) to the center back waistline. When a dress is constructed, the back dress length measurement is needed. The ***back dress length*** measurement is obtained by adding the center back skirt length measurement to the center back bodice length measurement.

Measuring Men and Boys

Men and boys should wear undershirts and lightweight pants when being measured. The client should not wear a belt. Before selecting men's or boy's patterns, the basic measurements included in the following list should be taken:

- height – As when measuring females, ***height*** is measured while the client wears no shoes and stands with his back against a wall. A ruler is placed on top of the head and a mark is made where the ruler touches the wall. The person measuring then measures from the floor to the mark.
- neck circumference or neckband – The ***neck circumference*** or ***neckband*** measurement is taken around the fullest part of the neck at the Adam's apple.
- chest – The ***chest*** measurement is obtained by measuring around the fullest part of the chest and back.
- waist – The ***waist*** measurement is obtained by measuring around the body where the waistline seam on the pants rests. The pants should be adjusted to the position the client prefers and the tape measure should be parallel to the floor.
- hips – The ***hips*** measurement is taken by measuring at the fullest part of the hips. The person measuring should record the distance from the natural waistline that the hip measurement is taken.
- shirt sleeve length – The ***shirt sleeve length*** measurement is obtained by measuring from the base of the neck at the center back, across the shoulder to the elbow, and over the slightly bent arm to the wrist.

Besides these basic measurements, the following additional measurements may be taken in order to achieve a good fit when altering men's and boys' patterns:

- back neck to waist or back waist length – As when measuring females, the ***back neck to waist*** or ***back waist length*** measurement is taken by measuring from the client's prominent neck bone to the natural waistline at the center back.
- shoulder length – As when measuring females, the ***shoulder length*** measurement is taken by measuring from the base of the neck to the top of the arm (tip of the shoulder). The base of the neck can be located by shrugging the shoulders. The top of the arm can be located by raising the arm as high as the shoulder to find the joint.
- arm length – As when measuring females, the ***arm length*** measurement is secured by measuring from the top of the arm (at the shoulder bone) over a slightly bent elbow to the wrist bone.
- trouser inseam – The ***trouser inseam*** measurement is secured by measuring from the crotch of the pants down the inside of the leg to the desired pants length.
- trouser outseam or trouser length – The ***trouser outseam*** or ***trouser length*** measurement is secured by measuring from the pants waistline seam down the side seam to the desired pants length.
- crotch length – The ***crotch length*** measurement is taken when the client is seated on a hard, flat chair by measuring from the waistline seam at the side down to the chair seat.
- crotch depth – The ***crotch depth*** measurement is taken when the client is seated, measuring from the natural waistline to the chair seat.

Measuring Children

Children should be measured wearing undergarments only. Children's measurements should be checked often since they grow quickly and measurements change. Patterns for children are grouped into several types. When a child's measurements fall between two pattern sizes, it is usually best to select the larger size. To select patterns for toddlers, children, and girls, the following basic measurements should be taken:

- weight – ***Weight*** should be calculated when selecting patterns for infants.

- height – ***Height*** is calculated using the same method that is used to measure women and men.
- breast – The ***breast*** measurement is taken by measuring under the arms over the fullest part of the chest in front and just under the shoulder blades in the back.
- waist or waistline – The ***waist*** or ***waistline*** measurement is taken using the same method that is used to measure women.
- hips – The ***hips*** measurement is taken by measuring around the body at the fullest part of the hips.
- back waist length – The ***back waist length*** measurement is obtained by measuring from the prominent bone at the base of the neck to the waist.
- finished dress length – the ***finished dress length*** measurement is taken by adding the back waist length measurement to the center back skirt length measurement.

In addition to the previously described measurements, the following measurements may be required in order to alter patterns for children:

- arm length – The ***arm length*** measurement is obtained by measuring from the top of the arm over the bent elbow to the wrist.
- shoulder length – The ***shoulder length*** measurement is taken by measuring from the base of the shoulder to the prominent bone at the outer edge of the shoulder.
- crotch depth – The ***crotch depth*** measurement is taken by having the child sit on a firm chair with feet flat on the floor and measuring from the natural side waistline to the chair seat.
- pants inseam – The ***pants inseam*** measurement is taken by the same method that is used to obtain the trouser inseam measurement for men.
- pants outseam – The ***pants outseam*** measurement is taken by the same method that is used to obtain the trouser outseam measurement for men.

DETERMINING FIGURE TYPE

To assist clients in purchasing correct pattern sizes, patterns are grouped according to height, proportion, and shape. These groups of patterns are called ***figure types***. The following basic figure types are used when selecting patterns for females: Misses', Miss Petite, Junior, Junior Petite, Young Junior/Teen, Half-Size, and Women's. The various figure types for females are illustrated in figure 10.2. Table 10.1 provides descriptions of these female figure types. For example, by reviewing the table one can determine that Misses' patterns are designed for females who are approximately 5'5" to 5'6" in height, well developed, and well proportioned. These females are taller and have longer back neck to waist measurements than all other female figure types except for Women's. The hip measurement is measured at 9" below the natural waistline. The Misses' figure type is considered to be the average female figure.

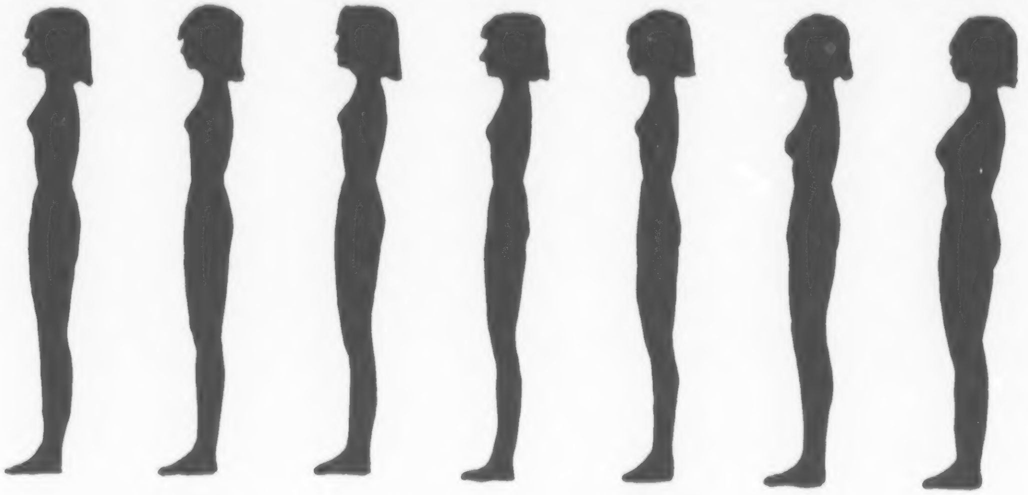


Figure 10.2

Female Figure Types	
Figure Types	**Descriptions**
Misses'	Approximately 5'5" tall; well developed; well proportioned; taller than other figure types except Women's; longer back waist length than other figure types except Women's; hips are measured 9" below waistline; considered the average figure type.
Miss Petite	Approximately 5'2" to 5'4" tall; proportions similar to Misses'; shorter overall than Misses'; narrower shoulder measurement than Misses'; hips are measured 7" below waist.
Junior	Approximately 5'4" tall; well developed; shorter back waist length and higher bustline than Misses'; hips are measured 9" below waistline.
Junior Petite	Approximately 5' to 5'1" tall; fully developed figure; shorter than Junior; similar proportions to Junior; hips are measured 7" below waistline.
Young Junior/ Teen	Approximately 5'4" tall; well developed; shorter back waist length and higher bustline than Misses'; hips are measured 9" below waistline.
Half-Size	Approximately 5'2" to 5'3" tall; larger waist, shorter back waist length, and narrower shoulder than Misses'; hips are measured 7" below waistline.
Women's	Approximately 5'5" to 5'6" tall; larger figure overall than Misses'; similar to Misses' in height and proportions; hips are measured 9" below waistline.

Table 10.1

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Patterns are selected for males using the following figure types: Boy's, Teen-Boy's, and Men's. Figure types for males are shown in figure 10.3. Table 10.2 provides descriptions of the three male figure types. For example, Men's figure type patterns are designed for males with a mature build and an average height of 5'10".

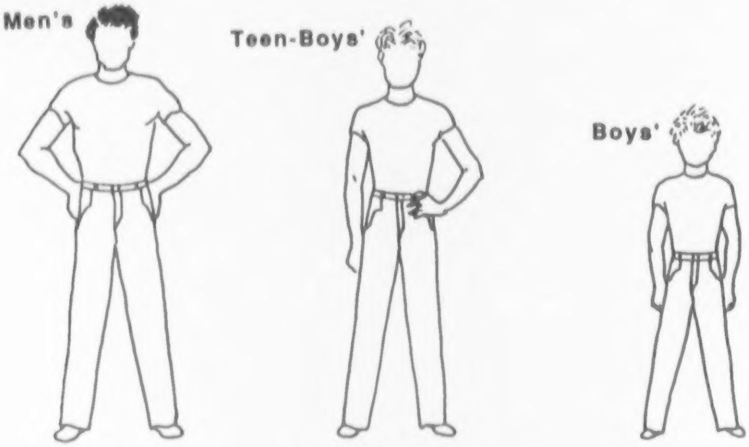


Figure 10.3

Male Figure Types	
Figure Types	**Descriptions**
Men's	For males with mature body build; average height of 5'10".
Teen-Boys'	For males who have not developed adult proportions.
Boys'	For young males who are growing.

Table 10.2

Patterns for children's clothing are grouped into the following categories to reflect styles and physical development of the average child at specific ages: Babies, Toddlers', Children's, Girls', and Chubbie. Figure types for children are illustrated in figure 10.4. Table 10.3 provides descriptions of the figure types for children. For example, Babies patterns are for infants who do not yet walk. Styles are usually appropriate for both boys and girls.

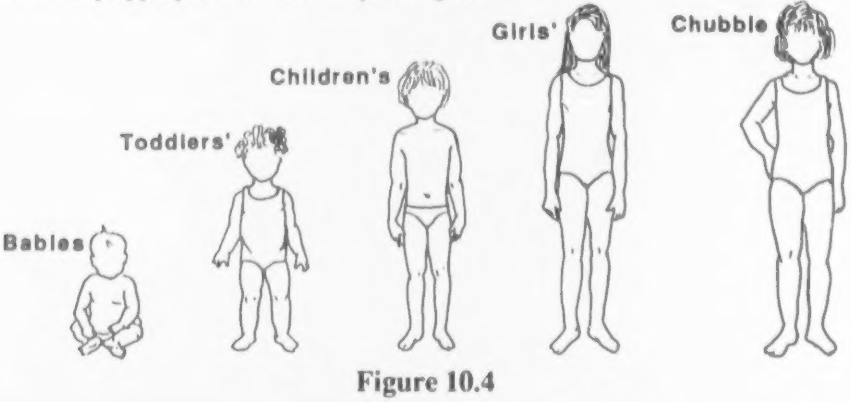


Figure 10.4

The names assigned to different figure types are not intended to indicate that pattern size should be selected according to the age of the client. Each person's body matures and grows at an individual rate. It is possible that a male teenager may find Men's sizes more comfortable to wear than Teen-Boy's sizes. A female teenager may find that Misses' sizes fit more comfortably than Young Junior/Teen sizes.

Children's Figure Types

Figure Types	Descriptions
Babies	For infants who are not walking; ease is allowed for diapers; styles are usually appropriate for boys and girls.
Toddlers'	For toddlers who are between babyhood and childhood; ease is allowed for diapers; styles are usually appropriate for boys and girls.
Children's	Same breast and waist measurements as Toddlers'; height is taller than Toddlers'; shoulder, arm, and dress lengths are longer than Toddlers'.
Girls'	For figures that have not begun to mature; similar to Boys' sizes; height is taller than Boys'.
Chubbie	For growing girls; weight is above average for age and height; height is about the same as for Girls'.

Table 10.3

SELECTING PATTERN SIZE

In 1968, patterns were standardized so that patterns from various pattern companies are based on the same measurements. Pattern companies have developed size range charts like those shown in table 10.4, table 10.5, and table 10.6. Once a client's figure type has been identified, the custom sewer is able to use the appropriate size range chart and the client's personal measurements to select the best pattern size.

When selecting a pattern size, it is important to remember that major pattern companies follow the same set of body measurements for bust, waist, hip, and back neck to waist. However, patterns from different companies usually differ in shoulder width slant, shape of the armhole and neckline, and slant of the underarm. The amount of ease added to patterns may also differ with patterns made by different pattern companies. Because of these variations in pattern shape and seam allowance, one pattern brand may fit a particular client better than others.

Once the client's figure type has been identified, it is important to identify the client's pattern size within that figure type. The first step in selecting pattern size is to compare the client's bust/chest, waist, and hip measurements with those listed on the chart on the back of the pattern envelope. The measurements on the pattern envelope that are closest to the client's measurements indicate the correct pattern size. Refer to figure 10.6 for an example of the information found on the back of the pattern envelope.

Few people have measurements that exactly match the measurements on the back of a pattern envelope. If a client's measurements fall between two pattern sizes, it is usually best to select the smaller size if the design of the garment is full or loose fitting. It is usually best to select the larger size if the design of the garment is closely fitted. As a result of the differences between the client's measurements and the pattern measurements, alterations must be done by the custom sewer.

Assisting Clients

When a client brings pattern, fabric, and notions to be made into a garment, the custom sewer should use the following guidelines:

- Verify that the pattern is the correct figure type and size for the client. Refer to the client's personal measurement chart. Recheck the client's measurements if needed. Compare the client's measurements to the measurements on the pattern envelope.
- Identify the pattern view the client prefers and circle the selected view on the pattern envelope.
- Determine if the fabric is suitable for the garment design.
- Decide if enough fabric yardage was purchased to make the selected pattern view. Check the yardage required for width of fabric and fabric nap, if any, for the view desired. Consider if enough yardage was purchased to allow for alterations and matching fabric patterns.
- Confirm that the client purchased additional items needed such as interfacing, lining, underlining, or trim.
- Confirm that the client purchased notions in the needed quantities.
- Confirm that all pattern pieces needed to construct the garment are enclosed in the pattern envelope along with the instruction sheets.

Using the Pattern Envelope

A variety of information needed by the custom sewer can be found on the pattern envelope. The following information is found on the front of the pattern envelope:

- pattern brand
- pattern number
- price
- fashion illustration(s) of the views (styles)
- pattern category of special features (such as knits only, easy to sew, or designer)
- figure type and size
- bust or chest measurement

Figure 10.5 shows information found on the front of a pattern envelope.

The following additional information may be found on the back of the pattern envelope:

- garment description
- fabric and design suitability
- number of pattern pieces
- body measurements
- yardage chart
- suggested fabrics
- information on need for additional yardage for nap
- garment dimensions (finished length and bottom circumference)
- notions required
- line drawings of different views (back and front)
- company name and address

As noted previously, information found on the back of a pattern envelope is included in figure 10.6. Measurements are often provided on pattern envelopes in both U.S. standard units and metric units. Although U.S. standard units are most frequently used by most home sewers, metric units are frequently used in the textiles and apparel industries.

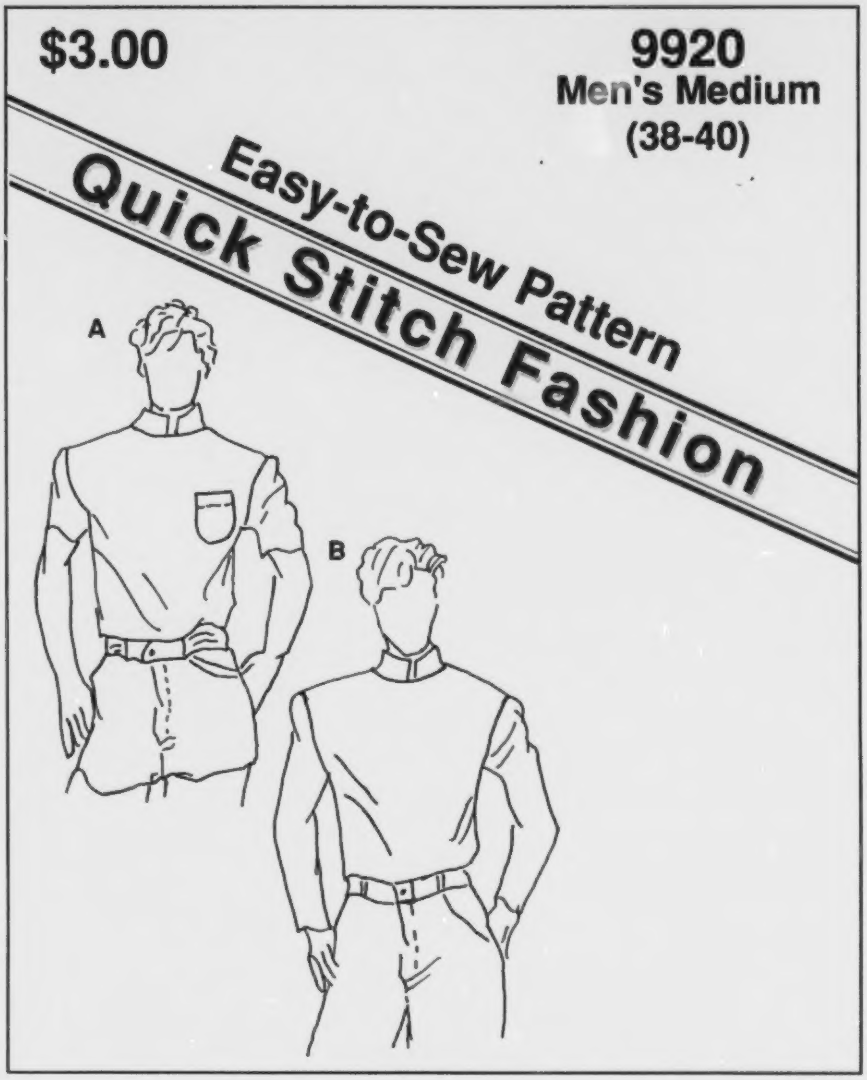

$3.00
9920
Men's Medium
(38-40)
Easy-to-Sew Pattern
Quick Stitch Fashion
A
B

Figure 10.5

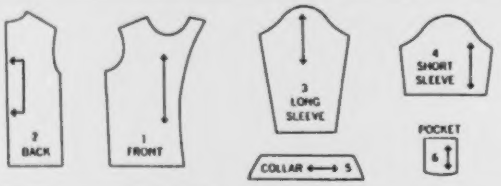
9920 Men's Shirt

Collared shirt has set-in sleeves. View A has short sleeves. View B has long sleeves.

BODY MEASUREMENTS	Small	Medium	Large	Extra Large	
Neck	14-14 1/2	15-15 1/2	16-16 1/2	17-17 1/2	Ins.
Chest	34-36	38-40	42-44	46-48	"
Waist	28-30	32-34	36-39	42-44	"
Hip	35-37	39-41	43-45	47-49	"
VIEW A					
35"-36" with nap	2 3/8	2 3/8	3 1/4	3 3/8	Yds.
44"-45" with nap	1 7/8	1 7/8	2 1/4	2 3/8	"
58"-60" with nap	7/8	7/8	1 1/4	1 1/4	"
VIEW B					
35"-36" with nap	2 7/8	3 1/4	3 5/8	4	Yds.
44"-45" with nap	2 1/2	2 1/2	2 7/8	3	".
58"-60" with nap	1 7/8	1 7/8	2 1/8	2 3/8	".
Interfacing for collar					
35"-36"	1/4	1/4	1/4	1/4	Yd.
44"-45" woven	1/4	1/4	1/4	1/4	"
Finished back length	30	30 1/2	31	31 1/2	Ins.

FABRICS: Cotton, broadcloth, denim, double knit, seersucker, corduroy, madras, gingham.

NOTIONS: Thread, seam tape



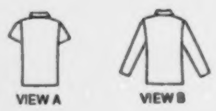


Figure 10.6

Size Range Charts – Female Figure Types

Misses'

Size	6	8	10	12	14	16	18	20
Bust	30½	31½	32½	34	36	38	40	42
Waist	23	24	25	26½	28	30	32	34
Hip	32½	33½	34½	36	38	40	42	44
Back waist length	15½	15¾	16	16¼	16½	16¾	17	17¼

Miss Petite

Size	6mp	8mp	10mp	12mp	14mp	16mp
Bust	30½	31½	32½	34	36	38
Waist	23½	24½	25½	27	28½	30½
Hip	32½	33½	34½	36	38	40
Back waist length	14½	14¾	15	15¼	15½	15¾

Junior

Size	5	7	9	11	13	15
Bust	30	31	32	33½	35	37
Waist	22½	23½	24½	25½	27	29
Hip	32	33	34	35½	37	39
Back waist length	15	15¼	15½	15¾	16	16¼

Junior Petite

Size	3JP	5JP	7JP	9JP	11JP	13JP
Bust	30½	31	32	33	34	35
Waist	22½	23	24	25	26	27
Hip	31½	32	33	34	35	36
Back waist length	14	14¼	14½	14¾	15	15¼

Young Junior/Teen

Size	5/6	7/8	9/10	11/12	13/14	15/16
Bust	28	29	30½	32	33½	35
Waist	22	23	24	25	26	27
Hip	31	32	33½	35	36½	38
Back waist length	13½	14	14½	15	15⅜	15¾

Half-Size

Size	10½	12½	14½	16½	18½	20½	22½	24½
Bust	33	35	37	39	41	43	45	47
Waist	27	29	31	33	35	37½	40	42½
Hip	35	37	39	41	43	45½	48	50½
Back waist length	15	15¼	15½	15¾	15⅞	16	16⅛	16¼

Women's	38	40	42	44	46	48	50
Bust	42	44	46	48	50	52	54
Waist	35	37	39	41½	44	46½	49
Hip	44	46	48	50	52	54	56
Back waist length	17¼	17⅜	17½	17⅝	17¾	17⅞	18

Table 10.4

Size Range Charts – Male Figure Types

Boys'					Teen-Boys'			
Size	**7**	**8**	**10**	**12**	**14**	**16**	**18**	**20**
Chest	26	27	28	30	32	33½	35	36½
Waist	23	24	25	26	27	28	29	30
Hip (seat)	27	28	29½	31	32½	34	35½	37
Neck circumference	11¾	12	12½	13	13½	14	14½	15
Height	48	50	54	58	61	64	66	68

Men's

Size	34	36	38	40	42	44	46	48
Chest	34	36	38	40	42	44	46	48
Waist	28	30	32	34	36	39	42	44
Hip (seat)	35	37	39	41	43	45	47	49
Neck circumference	14	14½	15	15½	16	16½	17	17½
Shirt sleeve	32	32	33	33	34	34	35	35

Table 10.5

Size Range Charts – Children's Patterns

Babies

Age	Newborn (1-3 months)	6 months
Weight	7–13 lbs.	13-18 lbs.
Height	17"–24"	24"–26½"

Toddlers'

Size	½	1	2	3	4
Breast or chest	19	20	21	22	23
Waist	19	19½	20	20½	21
Approximate height	28"	31"	34"	37"	40"
Finished dress length	14"	15"	16"	17"	18"

Children's

Size	1	2	3	4	5	6	6X
Breast or chest	20	21	22	23	24	25	25½
Waist	19½	20	20½	21	21½	22	22½
Hip				24	25	26	26½
Back waist length	8¼	8½	9	9½	10	10½	10¾
Approximate height	31"	34"	37"	40"	43"	46"	48"
Finished dress length	17"	18"	19"	20"	22"	24"	25"

Girls'

Size	7	8	10	12	14
Breast	26	21	28½	30	32
Waist	23	23½	24½	25½	26½
Hip	27	28	30	32	34
Back waist length	11½	12	12¾	13½	14¼
Approximate height	50"	52"	56"	58½"	61"

Chubbie

Size	8½c	10½c	12½c	14½c
Breast	30	31½	33	34½
Waist	28	29	30	31
Hip	33	34½	36	37½
Back waist length	12½	13¼	14	14¾
Approximate height	52"	56"	58½"	61"

Table 10.6

Points to Remember

- The success of a finished custom-made garment depends on the selection of a pattern in the correct figure type and size.

- Factors to be considered before a commercial pattern is selected include the purpose of the garment, influence on current fashion, influence of the elements and principles of design, kind of fabric, figure type, and pattern size.

- Taking measurements is a major factor in saving time during garment construction. Accurate measuring is important and can only be done if concentration and patience are used throughout the measuring process.

- Good measuring tools are essential for achieving accurate fit in custom clothing, alterations, or in apparel manufacturing. The key to sewing success is to measure often and accurately in addition to rechecking measurements.

- There are specific procedures to follow in measuring the human figure in order to make decisions regarding custom garments. When aligning the tape measure around the body, it should feel snug, but not tight. Measurements are more exact when taken by a person other than the individual being measured.

- A variety of measurements may be taken when choosing a commercial pattern, altering a pattern, or designing a pattern. When choosing a commercial pattern, the selection is usually based on only a few measurements. Additional measurements may be needed for pattern alteration.

- The basic measurements needed in order to select a pattern for a female client are height, back waist length, high bust, bust, waist, and full hip.

- The basic measurements needed in order to select a pattern for a male client are height, neck circumference, chest, waist, hips, and shirt sleeve length.

- Children's measurements should be checked often since they grow quickly and measurements change. When a child's measurements fall between two pattern sizes, it is usually best to select the larger size.

- To assist customers in purchasing correct pattern sizes, patterns are grouped according to height, proportion, and shape. These groups of patterns are called figure types.

- The following basic figure types are used when selecting patterns for females: Misses', Miss Petite, Junior, Junior Petite, Young Junior/Teen, Half-Size, and Women's.

- Patterns are selected for males using the following figure types: Boy's, Teen-Boy's, and Men's.

- Patterns for children's clothing are grouped into the following categories to reflect styles and physical development of the average child at specific ages: Babies, Toddlers', Children's, Girls', and Chubbie.

- The names assigned to figure types are not intended to indicate that pattern size should be selected according to the age of the client.

- When selecting a pattern size, it is important to remember that major pattern companies follow the same set of body measurements for bust, waist, hip, and back neck to waist. However, patterns from different companies may differ in other measurements.

- A variety of information needed by the custom sewer can be found on the pattern envelope.

Words to Know

abdomen
arm circumference
arm length (children)
arm length (females)
arm length (men and boys)
asymmetrical figure
automatic hem gauge
back dress length
back neck to waist (children)
back neck to waist (females)
back neck to waist (men and boys)
back waist length (children)
back waist length (females)
back waist length (men and boys)
basic pattern
breast
bust
bust point
bust point to waist bodice length
center back bodice length
center back skirt length
center front bodice length
center front skirt length
chest (females)
chest (men and boys)
commercial patterns
crotch depth (children)
crotch depth (females)
crotch length (females)
crotch length (men and boys)
ease
figure types
finished dress length (children)
5" below neck back width
form
French curve
full bust
full hip
girth
height
hem marker
high bust
hips (children)
hips (men and boys)
irregular curve
left side skirt length
L square
measuring stick
neckband
neck circumference
9" below waist
over the shoulder blade bodice length
pants inseam (children)
pants outseam (children)
pattern drafting
pattern draping
personal measurement chart
production patterns
right side skirt length
rise
rulers
7" below waist
sewing gauge
shirt sleeve length
shoulder length (children)
shoulder length (females)
shoulder length (men and boys)
shoulder to bust point bodice length
shoulder to elbow
shoulder to wrist
skirt marker
sleeve gauge
sleigh curve
sloper
tailor's square
tape measure
tape measure with a crotch piece
3" below waist
transparent ruler
triangle
trouser inseam
trouser length
trouser outseam
upper back width
vertical rulers
waist (children)
waist (females)
waist (men and boys)
waistline (children)
waistline (females)
waistline (men and boys)
weight
wrist
yardstick

Questions for Review

1. What are the differences in pattern drafting and pattern draping?
2. What is the main function of a tape measure? a tape measure with a crotch piece? a transparent ruler? a measuring stick? a ruler? a sewing gauge? an automatic hem gauge? a hem marker? a triangle? a French curve? an L square? a sleigh curve?
3. What are the general procedures to follow when measuring a client?
4. What are the basic measurements that are most often used when selecting patterns for females?

5. What are the basic measurements that are most often used when selecting patterns for males?

6. What are the measurements most commonly used when selecting patterns for children?

7. What are the different characteristics of the various female figure types?

8. What are the characteristics of the male figure types?

9. What are the characteristics of the children's figure types?

10. Why may one pattern brand fit a client better than other pattern brands?

11. If a client's measurements fall between two pattern sizes, which pattern size should be selected?

12. What types of information can be found on the front of the pattern envelope?

13. What types of information can be found on the back of the pattern envelope?

11

Pattern Alteration Procedures

ESSENTIAL ELEMENT

- Apply pattern alteration procedures to ensure custom fit of garment.(q4B)

OBJECTIVES TO ACHIEVE

- Identify characteristics of a well-fitted garment.
- Determine factors to consider when selecting patterns.
- Explain the importance of taking accurate client measurements and describe procedures for comparing measurements to pattern pieces.
- Apply procedures for completing basic pattern alterations.
- Examine the importance of fitting altered patterns.
- Compare procedures for combining patterns of different styles and patterns of different sizes.

Pattern alteration is changing a pattern in order to achieve proper fit and appearance. It is important for employees to understand pattern alteration techniques. Custom sewers, pattern makers, and designers should understand how pattern alterations are performed in order to construct garments that fit properly. Alteration procedures involving lengthening and shortening are basically the same for different types of garments. For example, the same basic procedures would be followed when altering length of patterns for pants, slacks, skirts, and bodices. Techniques for adding or subtracting width are also similar for different types of garments. Once basic alteration techniques are learned, garments with accurate fit can be produced.

CHARACTERISTICS OF A WELL-FITTED GARMENT

It is important for an employee to understand how and why a garment fits well. Unless a garment is properly fitted, it will not look professionally constructed. Proper fit can be achieved by altering the pattern while minor fitting adjustments can be made after a garment is constructed. Employees must be able to recognize fitting problems and apply appropriate alterations to solve those problems.

A well-fitted garment includes grain, balance, ease, set, and line. A properly fitted garment has adequate ease that is properly distributed, has lines that follow the lines and curves of the body, is on grain, has a smooth set, and is balanced on the body. These factors are related to and dependent upon each other. For example, if a garment is off-grain, the balance and set will not be accurate. Many times, one problem area is easier to identify than others. Sometimes when one problem is identified and corrected, other undesirable characteristics are corrected as a result.

Grain

Grain refers to the lengthwise and crosswise direction of yarns in a fabric. The yarns that are horizontal across the body indicate the ***crosswise grain***. The yarns that are vertical on a garment indicate the ***lengthwise grain***.

When a garment is fitted correctly, the lengthwise grain is perpendicular to the floor at the center front and center back of the garment. The crosswise grain is parallel to the floor at the center front and center back on the bust line and hip line.

Grain is very important in recognizing improper fit in a garment. The grain on the right half of the body should match the grain on the left half of the body. Garments do not have actual grain lines marked on them except when a striped or plaid fabric is used. An employee can easily recognize off-grain areas by examining the way the garment hangs or sets on the body.

Balance

A garment shows proper ***balance*** when it hangs the same distance from the body from right to left and front to back. Proper balance is achieved when a garment is on-grain and has sufficient ease. For example, a large body bulge causes a garment to be unbalanced and causes the crosswise grain to curve instead of hang straight. Employees should remember that figure types of clients will vary; therefore, it is important to have the ability to recognize custom fit when constructing garments for an individual.

Ease

As discussed in Chapter Ten, ease is the difference between the body measurement and the garment measurement at a given point. When a garment has the correct amount of ease, it is neither too loose nor too tight. Ease in a garment provides comfort without producing wrinkles or bulkiness and allows for easy movement. Ease also allows a garment to adjust naturally to the movements of the wearer.

There are two types of ease. ***Wearing ease*** is the amount of fullness needed in a garment for movement and comfort. ***Design ease*** is the designed-in fullness that causes some garments to measure considerably larger than the body either overall or in particular areas. Design ease is used to create a particular style or silhouette.

The exact amount of ease required in a particular garment is determined by factors such as current fashion, body build, activity, and fabric type. Minimum amounts of ease have been established as guidelines to observe when fitting. However, these standards often vary among different styles and designers. Average ease amounts are included on the personal measurement chart in Chapter Ten.

In order to evenly distribute ease, it must be added to all four quarters of the garment. Each major pattern piece represents 1/4 of the client's body. The total amount of ease required is divided by four to find the amount needed in each quarter of the pattern. For example, if 2" of ease are needed, 1/2" of ease should be allowed in each quarter of the garment. When checking a garment for the correct amounts of ease, it is important to pin tucks into the garment when fitting. Since a tuck has two thicknesses, it removes twice the amount of its width. Therefore, the width of the tuck should be half the amount of ease needed.

Set

Set refers to the way a garment fits or hangs on the body. When a garment fits properly, it sets smoothly over body bulges without wrinkling, bulging, sagging, or straining. Although the body is made up of many different kinds of curves, there are seven basic curves referred to as ***body bulges***. The seven body bulges that must be considered when fitting a garment are the bust, end of shoulder, shoulder blade, elbow, abdomen, side hip, and back hip.

Wrinkles are produced when a garment is strained over a curve or bulge. Diagonal or slantwise wrinkles usually point to the body bulge causing the strain. Crosswise or horizontal wrinkles usually occur when a garment is too tight or too long. Vertical folds appear when there is too much width in a garment. Proper set can usually be achieved by adjusting seam allowances.

Line

As discussed in Chapter Eight, line is one of the elements of design. Line indicates direction, length, width, and straightness. Garment lines may be decorative or structural. Structural lines are sometimes called construction lines. Construction lines include basic lines such as yokes, seam lines, pockets, necklines, and pleats.

Construction lines can be vertical, horizontal, or diagonal. Diagonal and vertical lines usually cause a figure to appear taller while horizontal lines usually cause a figure to appear wider and shorter. However, diagonal and vertical lines can sometimes cause a figure to appear shorter, and horizontal lines can cause a figure to appear taller. Therefore, employees should be skilled in the use of line in order to achieve desired effects. Table 11.1 describes various construction lines.

Silhouette seams are examples of construction lines. ***Silhouette seams*** help determine the silhouette or outline of a garment. These seams include the shoulder seam and all side seams. Silhouette seams should appear halfway between the front and back of the figure. When a garment is viewed from the side, silhouette seams, except the shoulder seam, should be perpendicular to the floor.

Circumference seams are also examples of construction lines. ***Circumference seams*** are smooth seams that follow the natural curves of the body. Circumference seams encircle the body at the neckline, armhole, waistline, and hemline. Each circumference seam has specific requirements for proper fit.

PATTERN SELECTION

Since they are made to be purchased by many customers, patterns are designed and sized to fit average figures. Many figures, however, are not average. A pattern may fit a client well in some areas while it may not fit well in other areas. It is important for an employee to be able to identify the areas where a pattern needs adjusting. The fit of a finished garment depends on the adjustments that are made to the pattern before the garment is actually constructed.

Construction Lines	
Type	**Description**
Armseye Seam	The ***armseye seam*** is a circumference seam that is created when a set-in sleeve is attached to the armhole of a bodice. The top of the armseye seam lies on the prominent bone at the edge of the shoulder. From the front, the armseye seam should appear to be straight from the shoulder tip to the point at which it disappears under the arm. The armseye seam should be perpendicular to the floor from the top of the shoulder to the point where it begins to curve under the arm.
Center Back Seam	The ***center back seam*** is located along the center of the vertebrae. It is straight and perpendicular to the floor. The center back seam visually divides the figure into two halves.
Center Front Seam	The ***center front seam*** is straight and points to the hollow of the throat. It is perpendicular to the floor and visually divides the figure into two halves.
Darts and Tucks	Darts and tucks release their fullness at the fullest point of the body contour. Darts and tucks are spaced to form pleasing proportions with other construction lines.
Neckline Seam	The ***neckline seam*** fits the curve at the base of the neck. It should touch the hollow of the throat in front, intersect the neck and shoulder, and touch the most prominent vertebrae at the back of the neck. The neckline seam should appear to rest comfortably at the base of the neck.
Shoulder Seam	The ***shoulder seam*** extends from the neck, beneath the back of the ear lobe, to the bone at the top of the shoulder. The shoulder seam should not be seen from the front or back. It should be well-balanced between the front and back when viewed from the side.
Side Seam	The ***side seam*** forms a straight line that is perpendicular to the floor. It is visually balanced in the front and the back when viewed from the side. A side seam should be inconspicuous when viewed from the front or back.
Waistline Seam	The ***waistline seam*** is the line on the torso that creases when the torso is bent. The waistline seam should be parallel to the floor when viewed from the side. It should also fit snugly but not too tight.

Table 11.1

To avoid making unnecessary pattern alterations, employees should attempt to assist clients in making wise pattern choices. Factors that should be considered when selecting a pattern include the following:

- purpose of the garment
- current fashion trends
- elements and principles of design
- type of fabric to be used
- figure type and pattern size
- sewing ability of the person who will construct the garment

Although these decisions are usually made by the client, employees should be prepared to answer questions and make suggestions when appropriate.

As discussed in Chapter Ten, it is important for a client to have her or his exact measurements available when choosing a pattern. Garments that fit properly rely on accurate measurements. Measurements of adults should be checked periodically and recorded on a personal measurement chart to ensure a custom fit. Measurements for children should be taken each time a pattern is purchased. Chapter Ten also includes information on the tools used when measuring the human figure.

To determine correct pattern size, the employee should compare the measurements recorded on the client's personal measurement chart with the body measurements listed on the pattern envelope. Major pattern companies follow the same set of body measurements for bust, waist, hip, and back waist length. However, patterns from different companies can differ in shoulder width slant, shape of armseye and neckline, and slant of the underarm. The amount of ease can differ also. Because of these variations in pattern shape and seam allowance, certain brands of patterns may fit a client better than other brands. Once a pattern is selected in the proper figure type and size, preparations for altering the pattern may be made.

PATTERN ALTERATION

Before a garment is cut out, the fit of the pattern should be checked. Usually, only simple adjustments to the pattern are necessary. Adjusting the pattern before a garment is cut out reduces the need for major alterations after a garment is constructed. When performing basic pattern alterations, the following steps should be completed:

- Take the client's measurements.
- Compare the client's measurements with the measurements on the pattern.
- Perform the required alterations.

Measuring Clients

To determine if the pattern chosen will require any alterations, the employee must first measure the client. Additional measurements are required when altering a pattern than when choosing a pattern since each body measurement is compared with the corresponding measurement on the pattern pieces.

During the measuring process, female clients should wear smooth undergarments that are normally worn. If desired, the client may wear a closefitting garment such as a body suit or leotard over undergarments. In addition to the basic measurements used when selecting patterns, the following measurements should be taken in order to achieve a good fit when altering women's patterns:

- 3" below waist
- 7" below waist
- 9" below waist
- shoulder length
- upper back width
- 5" below neck back width
- center front bodice length
- shoulder to bust point bodice length
- bust point to waist bodice length
- center back bodice length
- over the shoulder blade bodice length
- shoulder to elbow
- shoulder to wrist or arm length
- girth
- wrist
- center front skirt length

- right side skirt length
- center back skirt length
- left side skirt length
- crotch length
- crotch depth
- back dress length

Men and boys should wear undershirts and lightweight pants when being measured. In addition to the basic measurements used when selecting patterns, the following measurements should be taken in order to achieve a good fit when altering men's and boys' patterns:

- back neck to waist length
- shoulder length
- arm length
- trouser inseam
- trouser outseam
- crotch length
- crotch depth

Children should be measured wearing undergarments only. In addition to the basic measurements used when selecting children's patterns, the following measurements may be required in order to alter patterns for children:

- arm length
- shoulder length
- crotch depth
- pants inseam
- pants outseam

Detailed procedures for measuring women, men and boys, and children are included in Chapter Ten.

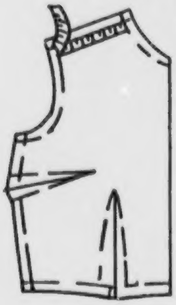
Comparing Measurements

To decide when and where pattern alterations are needed, an employee must compare the client's figure measurements with the corresponding measurements on the actual pattern. Some of the actual pattern pieces will be measured while other measurements will be compared with the measurements appearing on the pattern envelope.

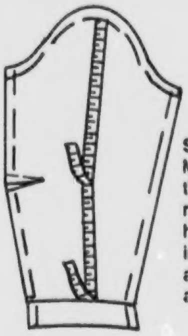
The client's measurements are not intended to exactly match those of the pattern. Garments do not and should not fit as closely as the tape measure. Room is needed in garments to sit, walk, reach, and bend. As discussed previously, this is known as wearing ease. Wearing ease is included in patterns and should be included when a pattern is altered.

When altering a pattern, the employee should make sure the pattern measures more than the figure measurements of the client. However, not all patterns require the standard amount of wearing ease. Patterns deigned for stretchy knit garments or strapless garments require less wearing ease. Average ease amounts to include when altering patterns are listed on the personal measurement chart in Chapter Ten.

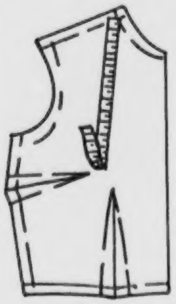
The client's bust, waist, hip, and back waist length measurements should be compared with the measurements given on the pattern envelope (without any allowance for wearing ease). Other measurements should be compared with the measurements of the actual pattern pieces. Procedures for comparing the client's measurements with the measurements of the pattern pieces are included in figure 11.1. Pattern pieces that measure a significant amount more or less than the client's measurements will need to be altered. Once the employee decides which pieces will be altered, basic pattern alterations can be made.



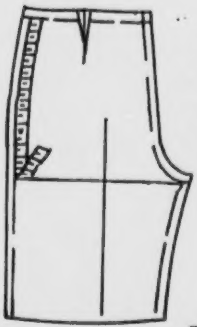
Shoulder Seam
Measure the shoulder seam on the pattern and compare it with the client's shoulder length measurement. For a dropped shoulder seam or yoke, measure the pattern at the shoulder markings.



Sleeve Length
Measure the pattern's sleeve length by measuring the sleeve down the center. On fitted sleeves, this will not be a straight line. For elbow dart placement, note how far from the shoulder the darts occur. This will indicate whether the sleeve length should be altered above and/or below the darts. Extra length should be allowed for a very full sleeve.

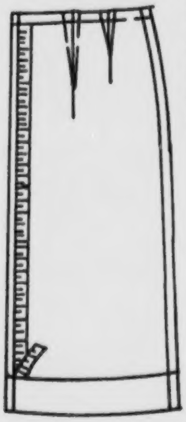


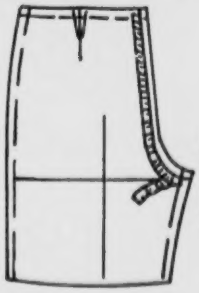
Bust Dart Placement
Measure the pattern from the neck seam toward the dart point to determine the bust point. Compare the client's bust point with the pattern. Bust darts should point toward the bust point but end 1" from it.



Crotch Depth
Draw a line, if there is not one on the pattern, at right angles to the grain from the side seam to the crotch point at the inseam. Draw the line on both the front and back pattern pieces. Measure along the side seam from the waist seam to the line drawn to determine the pattern crotch depth. Compare with the client's crotch depth measurement.

Finished Length
Compare the finished length given on the pattern envelope with the length desired by the client. If the finished length is not given on the pattern envelope, measure all patterns except pants patterns at the center back. Measure pants patterns along the side seam to determine the finished length.





Front and Back Crotch Lengths
Measure the crotch seam on the pattern and compare with the client's measurements. Stand the tape measure on its edge to measure accurately around curves of a pattern.

Figure 11.1

Performing Basic Pattern Alterations

When several pattern alterations will be made, length alterations should be completed first. It is important to make length alterations first so that width alterations will be made at the correct place on the pattern. Length alterations should be completed in the following order:

- above the waist
- below the waist or overall length
- at the sleeve

Once length alterations are completed, dart placement should be altered. When darts are pointing in the proper direction and are the correct length, width adjustments are made. Width adjustments should be completed in the following order:

- at the bust
- at the waist
- at the hip

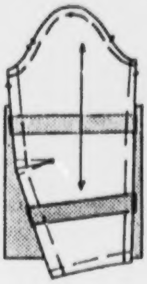
Additional specialized alterations are completed after all basic length and width changes have been made.

To ensure accuracy when completing pattern alterations, the following guidelines should be observed:

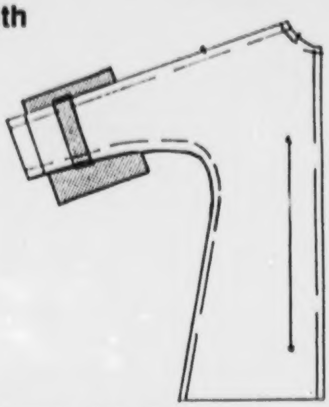
- Press the pattern pieces with a warm, dry iron to remove wrinkles before making any alterations.
- Pin the alterations in first, measure them for accuracy, and then tape the changes in place.
- Cut the pattern piece apart at the appropriate point and spread the cut pieces the appropriate amount to add length or width. Tape the cut pieces to a piece of tissue paper.
- Cut the pattern piece apart at the appropriate point and lap or fold the cut pieces the appropriate amount to decrease length or width. The amount of overlap should be half the measurement of the alteration. For example, when decreasing the length or width 1", the cut pieces should be lapped 1/2". Since 1/2" is removed from each cut piece, a total of 1" is removed from the total length or width.
- Be aware that up to 2" may be added or subtracted at the seam line when altering the width of a pattern piece. Divide the required amount to be increased or decreased by the number of seams and add or subtract the resulting amount at each seam.
- Draw a line between two designated points when increasing or decreasing at a location such as the shoulder seam. Slash the pattern piece between the two points. Leave the pattern piece intact. Spread or lap the slashed area the appropriate amount. Measure the alteration at the seam line to ensure accuracy.
- Redraw cutting or stitching lines as necessary. When an alteration interrupts a cutting or stitching line, draw a new line on the pattern. Taper the line gradually and smoothly into the original line. This keeps the alteration from being obvious in the finished garment.
- Make sure all pattern pieces are flat when alterations are completed. When a pattern piece is slashed, bubbles can form. Press bubbles flat before placing the pattern on the fabric for cutting.
- Keep grain lines and place on fold brackets matched when repositioning pattern pieces.
- Use designated alteration lines printed on the pattern pieces when appropriate.
- Be aware of alterations that may affect other pattern pieces. An alteration to one pattern piece may require a corresponding alteration elsewhere or a matching alteration on pieces that join the changed piece.

Figures 11.2 – 11.9 illustrate selected procedures for performing basic pattern alterations.

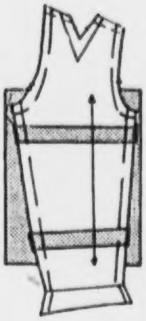
Increasing Length



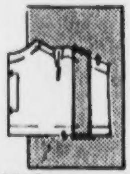
Fitted Sleeves
Add length at the designated alteration line(s). Use the measurement for elbow dart placement to determine the amount of length to add at each alteration line.



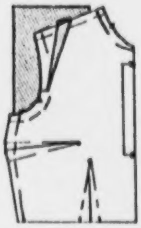
Kimono Sleeves
Add length at the designated alteration line. Only one alteration line is needed since the kimono sleeve is not fitted.



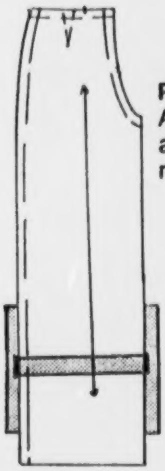
Raglan Sleeves
Add length at the designated alteration line(s). If two lines are given, add half the amount at each line to keep the sleeve shape.



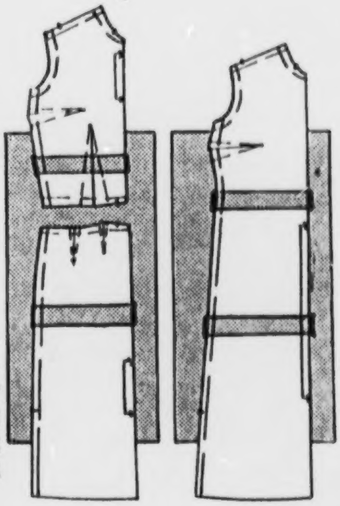
Shoulder Yokes
Add length by slashing the yoke pattern piece. Spread as needed. Alter bodice so seams are the same length.



Shoulder Seams
Add length by cutting the pattern from midway on the shoulder seam to the armhole seam line near the notch. Spread as needed.



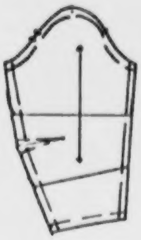
Pants
Add length at the designated alteration line. Spread as needed.



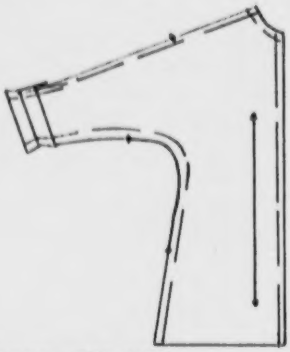
Dresses and Skirts
Add length at either a designated alteration line (at appropriate location above or below waist), above the waist mark at center back (to alter waist length), or below the waist mark (to alter the finished length).

Figure 11.2

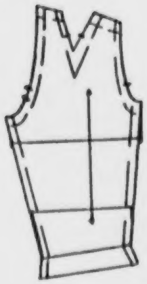
Decreasing Length



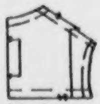
Fitted Sleeves
Decrease length at the designated alteration line(s). Use the measurement for elbow dart placement to determine the amount to decrease at each alteration line.



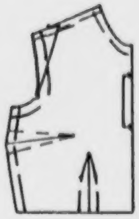
Kimono Sleeves
Decrease length at the designated alteration line. Only one alteration line is needed since the kimono sleeve is not fitted.



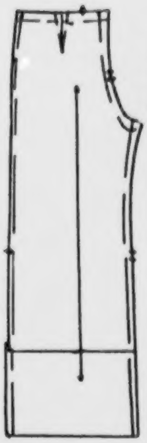
Raglan Sleeves
Decrease length at the designated alteration line(s). If two lines are given, decrease half the amount at each line to keep the sleeve shape.



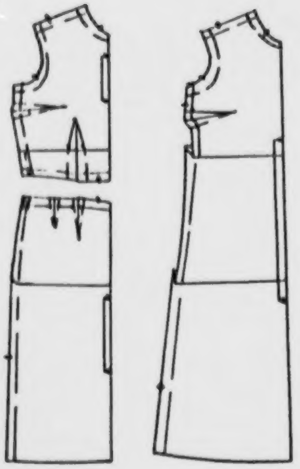
Shoulder Yokes
Decrease length by slashing the yoke pattern piece and lapping the edges as needed. Alter bodice so seams are the same length.



Shoulder Seams
Decrease length by cutting the pattern from midway on the shoulder seam to the armhole seam line near the notch. Lap the edges as needed to decrease the required amount.



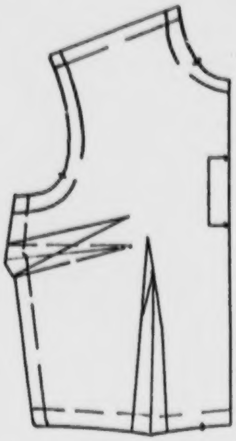
Pants
Decrease length at the designated alteration line. Lap the edges as needed to decrease the required amount.



Dresses and Skirts
Decrease length at either a designated alteration line (at appropriate location above or below waist), above the waist mark at center back (to alter waist length), or below the waist mark (to alter the finished length).

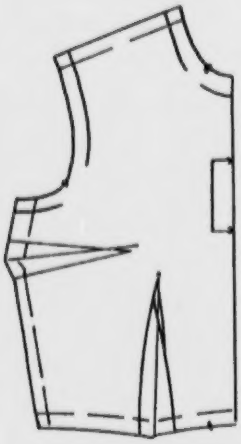
Figure 11.3

Bust Alterations



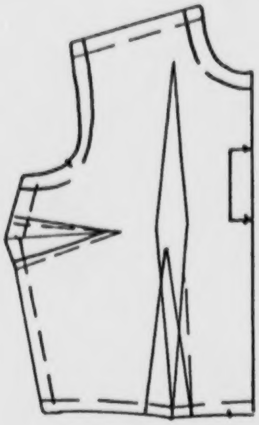
Raising Bust Darts

Raise bust darts by marking the location of the new dart point above the original dart. Draw new dart stitching lines to the new dart point. Taper the new stitching lines into the original stitching lines.



Lowering Bust Darts

Lower bust darts by marking the location of the new dart point below the original dart. Draw new dart stitching lines to the new dart point. Taper the new stitching lines into the original stitching lines.



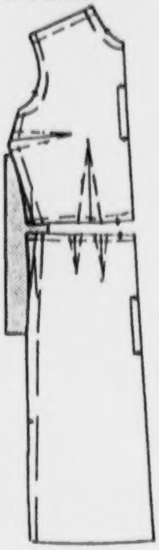
Enlarging the Bust Area of a Fitted Bodice

Enlarge the bust by cutting the pattern from the waist to the shoulder seam. Cut along the fold line of the waist dart and cut through the mark for the bust point. Cut the side bust dart on the fold line to within 1/8" of the bust point. Spread the vertical cut at the bust point by half the amount needed. Do not spread at the waist or shoulder. Locate the dart point within the cuts and redraw the dart stitching lines. Taper the new stitching lines into the original stitching lines.

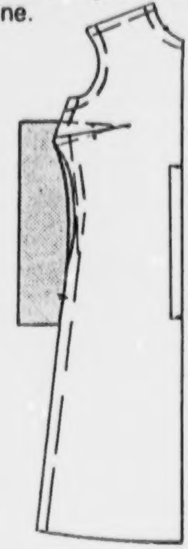
Figure 11.4

Increasing the Waistline

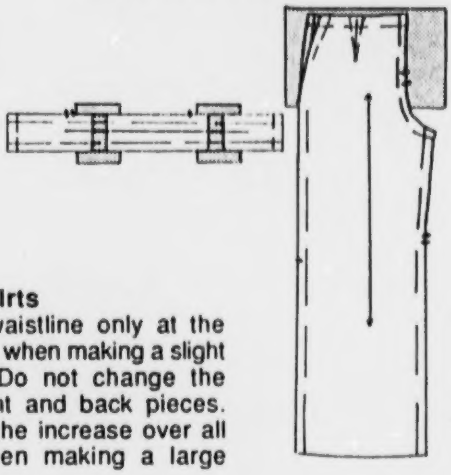
Fitted Dresses
Increase the waistline on the skirt and the bodice seam lines at the waist. Increase the same amount on both the bodice and the skirt.



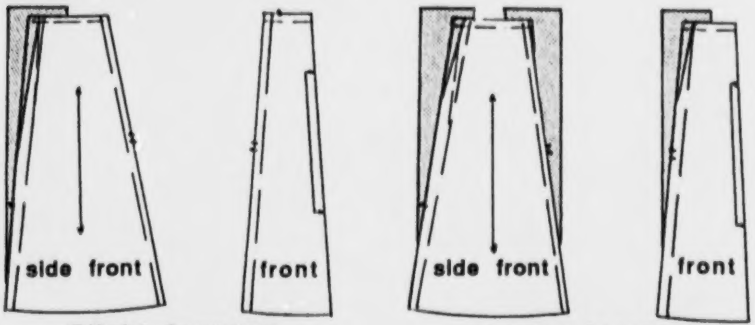
A-line Dresses
Increase the waistline at the waist only. Taper the adjustment into the seam line.



Pants
Increase waistline by adding 1/4 the total amount to be increased to each side seam (front and back pieces). When adding large amounts, add to the front and back crotch seams as well as the side seams. Taper to nothing at the curve of the crotch seam. Enlarge the waistband by the same amount and in the same places that the waist was increased. Cut and spread the waistband the amount needed.



Gored Skirts
Increase waistline only at the side seams when making a slight increase. Do not change the center front and back pieces. Distribute the increase over all seams when making a large increase.

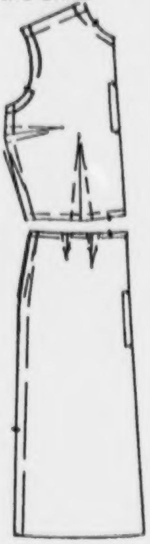


Slight Increase **Large Increase**

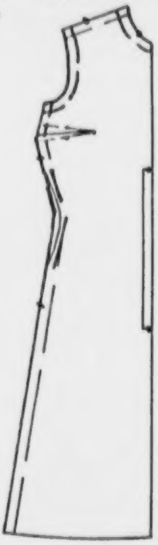
Figure 11.5

Decreasing the Waistline

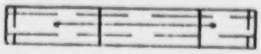
Fitted Dresses
Decrease the waistline on the skirt and the bodice seam lines at the waist. Decrease the same amount on both the bodice and the skirt.

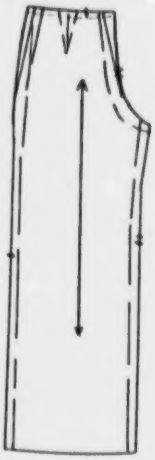


A-line Dresses
Decrease the waistline at the waist only. Taper the adjustment into the seam line.

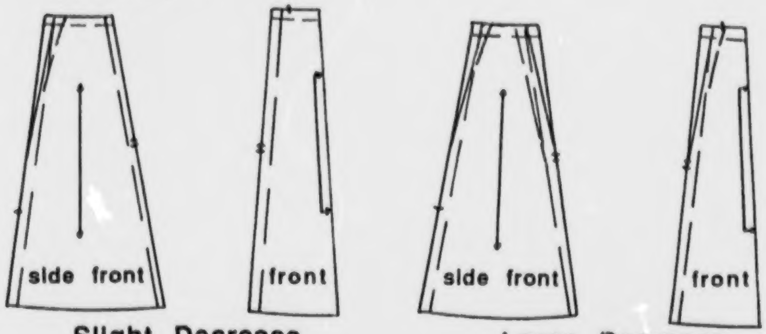


Pants
Decrease waistline by removing 1/4 the total amount to be decreased from each side seam (front and back pieces). When decreasing large amounts, decrease the front and back crotch seams. Taper smoothly into the original cutting line. Decrease the waistband by the same amount and in the same places that the waist was decreased. Cut and lap the waistband the amount needed.





Gored Skirts
Decrease the waistline only at the side seams when making a slight decrease. Do not change the center front and back pieces. Distribute the decrease over all seams when making a large decrease.

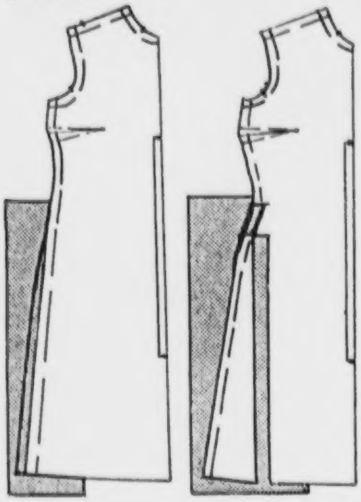


Slight Decrease Large Decrease

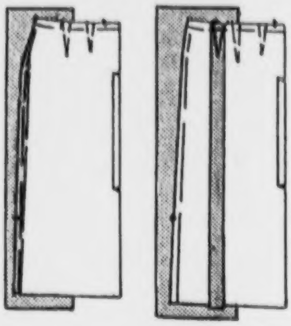
Figure 11.6

Increasing the Hip Line

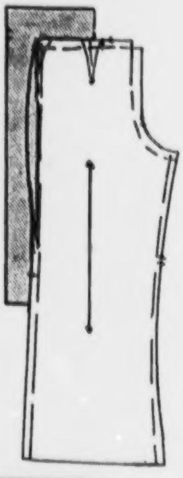
A-line Dresses
Increase the hip line at the side seams when increasing by 2" or less. Slash the pattern parallel to the grain line symbol when making an increase of more than 2". Spread 1/4 of the amount of the increase on the front and back pieces.



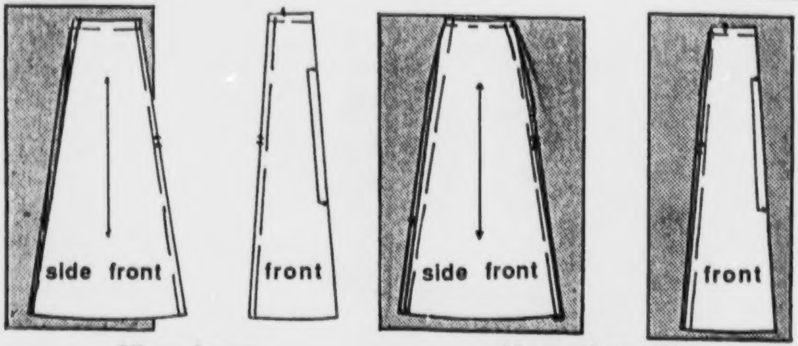
Fitted Skirts
Increase the hip line only at the side seams when increasing by 2" or less. Do not change the center front and back pieces. Slash the pattern parallel to the grain line symbol when making an increase of more than 2". Spread 1/4 of the amount of the increase on the front and back pieces and add a waist dart.



Pants
Increase the hip line at the side seams. Add 1/4 the total amount of the increase to each side seam (front and back pieces). Taper to the original cutting line at the waist and thigh.



Gored Skirts
Increase the hip line only at the side seams when increasing by 2" or less. Do not change the center front and back pieces. Distribute the increase over all seams when making an increase of more than 2". Taper to nothing at the waistline.

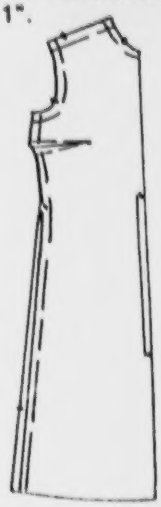


2" or Less   More than 2"

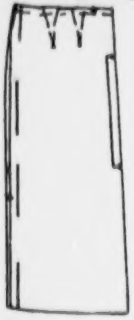
Figure 11.7

Decreasing the Hip Line

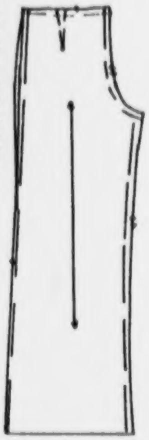
A-line Dresses
Decrease the hip line at the side seams. Taper into the waistline. Do not decrease by more than 1".



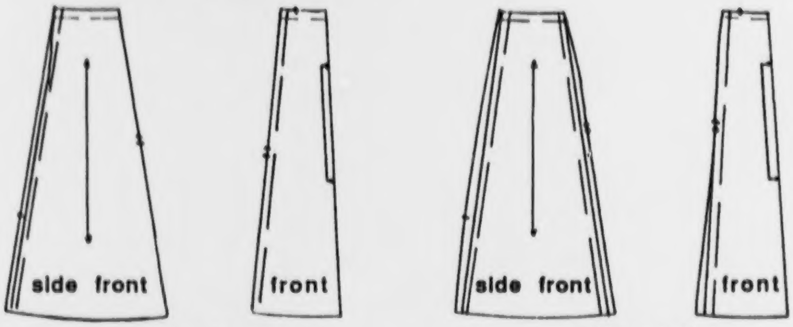
Fitted Skirts
Decrease the hip line only at the side seams when increasing by 2" or less Do not change the center front and back pieces.



Pants
Decrease the hip line at the side seams. Remove 1/4 the total amount to be decreased from each side seam (front and back pieces). Taper to the original cutting line at the waistline. Do not decrease more than a total of 1" since style lines may be lost.



Gored Skirts
Decrease the hip line only at the side seams when decreasing by 1" or less. Do not change the center front and back pieces. Distribute the increase over all seams when making an increase of up to but not more than 2". Taper to nothing at the waistline.



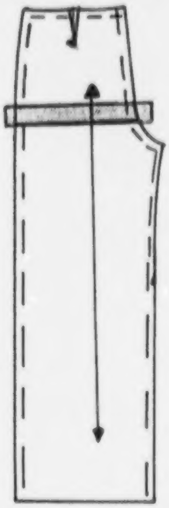
1" or Less

Up to 2"

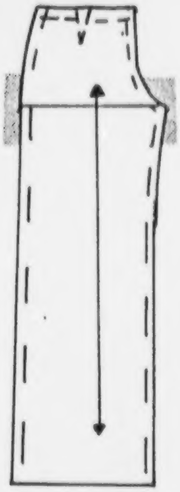
Figure 11.8

Crotch Alterations

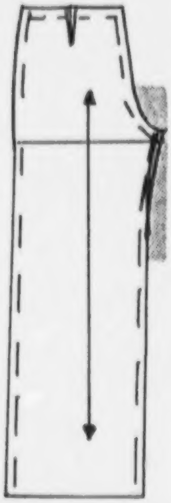
Increasing Crotch Depth
Add length at the designated alteration line. Spread the amount needed on both the front and back pieces.



Decreasing Crotch Depth
Decrease the length at the designated alteration line. Lap the edges as needed to decrease the required amount. Alter the front and back pieces the same amount.



Increasing Crotch Length (Crotch Point Method)
Draw a crotch line from the side seam to the crotch point (if not already on the pattern). Extend the line at the crotch point the amount needed. Draw new cutting lines at the inseam and crotch.



Decreasing Crotch Length (Crotch Point Method)
Draw a crotch line from the side seam to the crotch point (if not already on the pattern). Shorten the line at the crotch point the amount needed. Draw new cutting lines at the inseam and crotch.

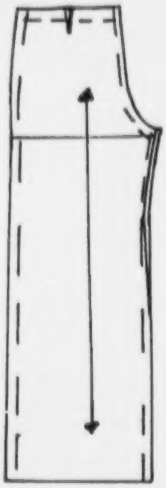


Figure 11.9

Fitting the Pattern

Once pattern alterations are completed, the employee should determine if the alterations are correct by fitting the pattern on the client. To fit the pattern on the client, the employee attaches the pattern pieces together and fits them on the client's body. It is not necessary to attach all of the pattern pieces. Correct fit can be determined by fitting only half of the pattern (either the right half or the left half). Pattern pieces should be attached to one another as follows:

- Cut out basic pattern pieces such as the bodice, skirt, and sleeves. Additional pattern pieces such as collars, facings, pockets, and belts are not needed during the fitting process.
- Trim to the cutting lines around curved areas such as the neckline, armseye, waistline, and crotch.
- Press the pattern pieces if needed using low, dry heat.
- Reinforce curved areas by applying transparent tape to the seam lines.
- Clip the seam allowances on the neckline curve and the lower portion of the armhole to the seam line at 1/2" intervals. Do not clip across the top of the armhole.
- Pin in pleats, darts, and hems according to marked lines. Darts should be folded as indicated on the pattern guide sheet but folded to the outside. Pins should be parallel to and on the stitching lines with the exception of the pins at the wide end of the dart. The pins at the wide end of the dart should cross the seam line.
- Pin the pattern pieces together with pins parallel to and on the seam lines. Pins should be placed on the outside of the pattern. Do not pin the entire pattern together. Pin units such as the bodice unit and the sleeve unit but do not pin the units together.

After the pattern pieces are pinned together, the employee must determine if the pattern fits the client properly. There are two methods for placing the pattern on the client for fitting. The pattern may be slipped onto the client's body and checked for fit, or the pattern may be attached to grosgrain ribbons that have been placed around the client's body.

When using the ***grosgrain ribbon method***, the employee places grosgrain ribbons around the client at the normal waistline, the fullest areas of the hip line, and just above the fullest part of the bust line. Once the ribbons are in place, the employee can pin the pattern to the ribbons and check the fit. When the pattern is fitted, the client should wear the undergarments that will be worn with the garment.

As each pattern unit is placed on the client's body, the employee should check to see if the unit fits properly. Characteristics of good pattern fit are included in table 11.2. If a pattern unit does not fit correctly, the employee should note where fitting problems occur and alter the appropriate pattern pieces. In some cases, a pattern piece that was previously altered may require an additional alteration.

When performing pattern alterations after checking the fit of the pattern, the employee should be aware that the same alteration may not be needed on both the front and back or right and left sides of the pattern pieces. For example, the front bodice may require a decrease in length while the back bodice may require an increase in length. One side of the bodice may require an increase in length while the other side may not require any change in length. Patterns often require uneven alterations unless the body is perfectly balanced and symmetrical.

After completing additional alterations, the employee should place the pattern units on the client again and check for proper fit. The employee should continue to alter and fit the pattern until the pattern units fit the client properly. Once alterations to the pattern pieces are completed and the pattern units fit the client properly, the pattern may be placed on the fabric for cutting.

Characteristics of Good Pattern Fit

Bodice

√ front and back are the correct length
√ width is appropriate at shoulders, back, bust, and waistline
√ shoulder seam lies flat along the shoulder and divides the shoulder equally from front to back
√ sleeve contains sufficient ease across the back of the shoulders when arms are folded across the chest
√ bust line and waistline contain sufficient ease
√ diagonal wrinkles do not appear
√ darts are positioned correctly and are the correct size
√ size of the neckline is appropriate

Skirt

√ side seam from waistline to hemline is in line with shoulder seam
√ width is appropriate at waistline and hip line and allows for sufficient ease
√ darts are positioned correctly and are the correct size
√ diagonal wrinkles do not appear
√ all vertical seams and grain line symbols hang perpendicular to the floor
√ hem allowance is sufficient

Sleeves

√ length of sleeve from shoulder to elbow and elbow to wrist is appropriate
√diagonal wrinkles do not appear
√width and ease of the sleeve cap and the upper and lower arm is sufficient
√ elbow darts are positioned correctly

Pants

√ front and back crotch depth is the appropriate length
√ width at the waistline and hip line is sufficient
√darts are positioned correctly and are the correct size
√diagonal wrinkles do not appear
√ vertical seams and grain line symbols hang perpendicular to the floor
√ hem allowance is sufficient

Table 11.2

The following guidelines should be observed when fitting patterns:

- Ask the client to verify if areas such as the waistline, center front, center back, and shoulder lines are accurately located when fitting the pattern.
- Do not fit the pattern too tightly. Allow ample ease for the design of the garment. Take the client's personal preferences into consideration when fitting the pattern.
- Use pins or light pencil markings to mark areas requiring further alterations.
- Press pattern pieces as needed using low, dry heat. Avoid pressing over tape used to make alterations.
- Redraw all grain lines, fold lines, and cutting lines after pattern alterations are complete in order to preserve the garment's original lines.

ALTERING CHILDREN'S PATTERNS

Children's patterns often require length and width alterations. The techniques for performing basic pattern alterations can usually be used to alter patterns for children's garments. In addition to basic pattern alterations, a client may request that special pattern alterations be done to children's patterns to provide for growth in height and width. Clients may request these alterations since garments that provide for growth in height and width can be worn for longer periods of time.

The following features can be easily incorporated into children's patterns to provide for growth in height:

- Include deep hems or tucks at the bottoms of sleeves and garments. Hems can be as deep as 5".
- Add tucks at the waistlines of dresses and pants to lengthen the upper part of the dress or lengthen the crotch.
- Place adjustable, long straps on jumpers, sun dresses, and overalls.
- Add horizontal tucks to yokes.
- Make shirts and blouses extra long.

To provide for growth in width, the following alterations can be made to children's patterns:

- Change set-in sleeves to cap, raglan, or kimono styles.
- Add tucks, pleats, or gathers at the shoulder line.
- Include large underarm or leg seams.

COMBINING PATTERN STYLES

Occasionally, a client may want to combine features from different patterns. For example, a client may like the sleeves of one design and the bodice of another design. Patterns of different styles often can be combined to achieve the look the client desires.

Within each size range of the same brand of pattern, the structural body relationships, such as shoulder to neck and bust to waist, remain the same. A size twelve bodice from one style number will fit a size twelve skirt from another style number as long as the patterns are the same brand. Necklines, collars, sleeves, and other features from two different style numbers of the same brand of pattern may be combined if the structural features are the same. To determine if two patterns can be combined, the employee may want to construct a sample garment using muslin.

When combining patterns, the employee should study the patterns carefully before substituting collars and sleeves. The necklines of two bodice patterns should match line for line in order for the collar from one to be used on the other. Therefore, collars of different styles should be interchanged only when the bodice pieces match closely. In addition, the location of the closing should be the same.

The style of the bodice controls the size of the sleeve cap and the amount of ease. Therefore, the style of the bodices should be similar if sleeves will be interchanged. In addition, the shoulder seams of the two bodices should be at the same angle and end at the same point where the arm joins the body, and the armhole curves should be alike.

COMBINING PATTERN SIZES

Few figures are perfectly balanced and symmetrical. Often a client's upper body and lower body will be different sizes. Therefore, it is sometimes easier to combine two pattern sizes rather than make major alterations to one pattern size. Many patterns are available with a range of sizes included in one pattern envelope. Instructions are often included for combining the sizes.

When adjusting the waistlines of two pattern sizes, the employee should note the difference in the waistline measurements of the two sizes. If the client's waistline measurement is the same as one of the patterns, the other pattern should be adjusted to correspond. To adjust the waistlines of both patterns to the same measurement, the employee should determine the amount by which each waistline must be enlarged or reduced. This amount should be divided among the seams, and each pattern piece should be adjusted accordingly.

The following general guidelines should be observed when combining patterns of different sizes:

- Keep center fronts, center backs, and grain lines straight.
- Adjust waistline darts on fitted garments so they match when joined. In women's dress patterns, move either the bodice or skirt darts.
- Cut apart patterns without waistlines and tape the skirt and bodice sections of the two patterns together.

Points to Remember

- Ease, which is determined by factors such as current fashion, body build, activity, and type of fabric, should be distributed evenly to each side of a garment.
- Silhouette seams and circumference seams are types of construction lines that help indicate direction, length, width, and straightness in a garment.
- Lengthwise grain should be perpendicular to the floor at the center front and center back of a garment. Crosswise grain should be parallel to the floor at the center front and center back of a garment.
- Garments should set smoothly over body bulges without wrinkling, bulging, sagging, or straining.
- A garment that is balanced hangs the same distance from the body from right to left and front to back, is on-grain, and has sufficient ease.
- The client's exact measurements are necessary in order to choose a pattern that will require the least amount of alterations.
- When a pattern requires alteration, the employee should take the client's measurements, compare the client's measurements with the measurements on the pattern, and then perform the required alterations.
- To determine what pattern alterations are necessary, the client's measurements must be compared with measurements of the actual pattern pieces.
- Basic pattern alterations include increasing length, waist, hip line, crotch depth, and crotch length; decreasing length, waist, hip line, crotch depth, and crotch length; raising bust darts; lowering bust darts; and enlarging the bust area.
- When alterations are complete, pattern pieces should be attached and placed on the client's body to check for proper fit.
- Children's patterns may be altered so garments will allow for growth in height and width.
- Patterns of different styles or patterns of different sizes may be combined to achieve a desired look or fit.

Words to Know

armseye seam
balance
body bulges
center back seam
center front seam
circumference seams
crosswise grain
design ease
grain
grosgrain ribbon method
lengthwise grain
neckline seam
pattern alteration
set
side seam
silhouette seams
shoulder seam
waistline seam
wearing ease

Questions for Review

1. Why are patterns altered before a garment is constructed?
2. How do wearing ease and design ease differ?
3. How does line contribute to the fit of a garment?

4. Why is it important for a garment to be on-grain?
5. What are indications of improper set?
6. How can proper balance be achieved?
7. How can unnecessary pattern alterations be avoided?
8. Why is it important for clients to be measured accurately?
9. Why are a client's measurements compared to the measurements of the pattern pieces?
10. What guidelines should be followed to ensure accuracy when completing pattern alterations?
11. What basic pattern alterations are commonly performed?
12. Why should the pattern be placed on the client's body after alterations are completed?
13. How does the grosgrain ribbon method of fitting differ from slipping pattern units onto the body to check for fit?
14. What characteristics indicate good pattern fit?
15. Why do clients request that children's patterns be altered to provide for growth in height and width?
16. Why should patterns that will be combined be of the same brand?
17. Why are patterns of different sizes often combined?

12

Unit Construction Techniques

ESSENTIAL ELEMENT

- Apply unit construction techniques.(q4C)

OBJECTIVES TO ACHIEVE

- Identify types of information found on the pattern and the pattern guide sheet.
- Demonstrate proper procedures for preparing fabric, laying out a pattern, and cutting.
- Compare methods of transferring pattern symbols to fabric.
- Compare procedures for constructing and attaching facings, interfacing, and linings.
- Demonstrate methods of constructing seams, casings, and hems.
- Apply procedures for constructing and attaching collars, sleeves, and waistbands.
- Outline methods of forming buttonholes and attaching pockets and zippers.
- Discuss the importance of fitting garments during unit construction.

Employees in the textiles and apparel industries must be skilled in time management techniques in order to complete garments quickly. One method that incorporates effective time management is the unit method of garment construction. The ***unit method of construction*** is an organized way of completing one unit or section of a garment at a time. Each individual piece of a garment is a ***unit***. As a garment is constructed, pieces of the garment are combined to form new units. The unit method of construction is often used by apparel manufacturers when mass producing garments.

Since it is easier to work with smaller areas, construction should be completed within each unit before units are sewn together. Darts, tucks, gathers, and pleats should be stitched; details such as buttonholes should be completed; staystitching should be completed; and interfacing should be applied. Once construction is completed, the units should be pressed. After being pressed, the units may be sewn together.

Before unit construction can begin, the employee must place the pattern pieces on the fabric, cut the fabric, and mark details on the fabric. Once the fabric is marked, units can be constructed. After units are sewn together, the garment should be fitted on the client.

PATTERNS

Patterns are usually packaged in pattern envelopes. Information about a pattern is printed on the front and the back of the pattern envelope. Examples of both the front and the back of a pattern envelope are included in Chapter Ten. The pattern envelope also contains pattern pieces and a pattern guide sheet. Each pattern piece is usually marked with the name of the piece and a letter for easy identification. Each pattern piece also may include the pattern number, the size of the pattern, and the number of pieces to cut.

Pattern Symbols

A variety of symbols that serve as guides when cutting and sewing appear on pattern pieces. ***Pattern symbols*** or ***pattern markings*** are images on the pattern pieces that identify specific construction details such as grain lines, stitching lines, seam allowances, and notches. Common pattern symbols include the following:

- adjustment line or alteration line – An ***adjustment line*** or ***alteration line*** is a double line that indicates where the length of a pattern piece may be increased or decreased if needed.
- buttonhole symbol – A ***buttonhole symbol*** is a solid line that indicates the length and exact location of a buttonhole.
- center front marking and center back marking – The ***center front marking*** and ***center back marking*** both consist of a solid line identifying the location of the center of a garment. These markings are usually clearly labeled and may also be identified by a seam line, fold line, or other solid line.
- dot – A ***dot*** is a round marking that is used to match adjoining pattern pieces. These markings may also be in the shape of a triangle or square.
- cutting line – A ***cutting line*** is the heavy outline around the perimeter of a pattern piece. Cutting lines indicate where the fabric should be cut.
- dart symbol – A ***dart symbol*** consists of dots and stitching lines that meet at a point. Dart symbols indicate the correct position of darts.
- grain line marking – A ***grain line marking*** is a straight line with arrows at each end. It appears on pattern pieces that are not cut on a fold. The grain line marking should be placed parallel to the selvage. A selvage is a narrow, woven edge made with special, strong yarns that are woven tightly to prevent raveling.
- hemline – A ***hemline*** is a solid line that indicates the suggested finished edge or length of a garment.
- notches – ***Notches*** are diamond-shaped symbols used to correctly match pattern pieces during construction.
- placement line – A ***placement line*** is a solid or broken line indicating the exact location of zippers, pockets, trims, and pleats.
- place on fold bracket – A ***place on fold bracket*** is a solid line with directional arrows. The arrows indicate that the outer line should be placed on the folded edge of the fabric
- stitching line or seam line – A ***stitching line*** or ***seam line*** is a broken line that indicates where seams should be sewn.

Examples of these pattern symbols are included in figure 12.1.

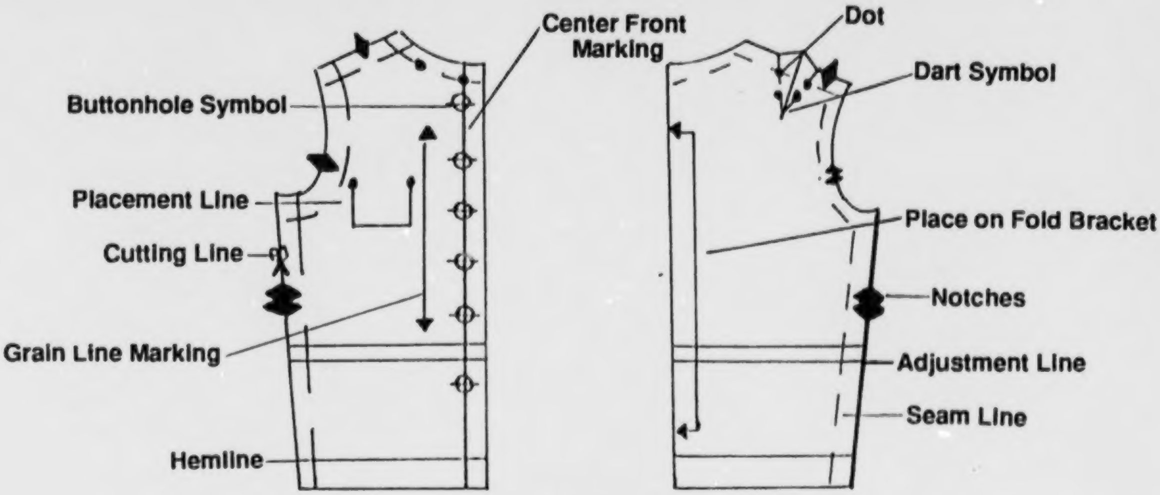


Figure 12.1

Pattern Guide Sheet

The ***pattern guide sheet*** is a set of instructions for using the pattern. The pattern guide sheet contains general information, cutting layouts, and sewing directions. The front of the guide sheet usually contains general information such as the following:

- drawings of the front and back views of each garment
- a diagram of all pattern pieces
- descriptions of pattern symbols included on the pattern pieces
- directions for preparing the pattern and laying it out on the fabric
- instructions for transferring markings from the pattern pieces to the fabric
- definitions of special terms used in the directions
- an explanation of how to lengthen and shorten the pattern pieces
- an explanation of the shading used to distinguish different fabric layers and the reverse sides of pattern pieces

A ***cutting layout*** is a diagram that shows how to position the pattern pieces on the fabric. Diagrams of several different cutting layouts are usually included on the guide sheet. The cutting layout to be followed should be chosen according to the view being constructed, the pattern size, and the width of the fabric. Once the appropriate cutting layout is chosen, it should be circled so it will be easy to locate when the pattern is laid out and pinned.

Sewing directions are usually located on the back of the guide sheet. An additional guide sheet containing sewing directions may be included in patterns that have several views or garments. ***Sewing directions*** are step-by-step instructions that explain how to sew garment pieces together. Each step usually includes an illustration to aid in understanding the procedure to be performed.

An employee should study the pattern guide sheet thoroughly before placing the pattern on the fabric. Failure to understand the guide sheet and follow directions can result in ruined fabric and loss of time.

COORDINATION OF PATTERN AND FABRIC

Fabric should add to the appearance of a garment and express the design of the pattern. Characteristics such as the texture and weight of a fabric help determine if the fabric is appropriate for use with a specific pattern. It is difficult for a sagging fabric to hold a crisp, molded shape and for a stiff fabric to form soft gathers.

The color and design of a fabric also determine if the fabric is appropriate for use with a specific pattern. Garment details can be lost on a printed fabric, and a fabric with a large pattern may loose its look when cut into a number of pieces by garment lines. In addition, it may be difficult to match the design. Some garment designs are not suitable for fabrics with slanting, plaid, or striped designs.

Preparation of Fabric

Before pattern pieces are placed on the fabric and the fabric is cut, the fabric must be prepared. Most fabrics should be preshrunk and straightened before pattern pieces are cut out. When fabric is prepared properly, the fabric pieces can be sewn together easily, and the garment will fit properly upon completion and after wearing and laundering.

Preshrinking – ***Preshrinking*** is the process of shrinking fabric before construction of a garment in order to minimize further shrinkage during laundering or dry cleaning of the completed garment. Preshrinking also removes some fabric finishes that can cause stitching problems on some fabrics.

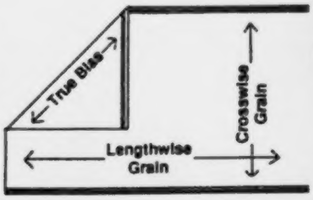
There are several methods for preshrinking fabric. The method that is used depends upon how the completed garment will be cleaned. The following methods may be used to preshrink fabric:

- hand-washable fabric – Fold the fabric and place in hot water for thirty minutes.
- washable fabric – Place in the washing machine with a regular load of laundry. Dry by laying flat with edges square or placing in a tumble dryer. Zigzag or hand overcast the raw edges before washing if the fabric will ravel.
- dry cleanable fabric – Have the fabric dry cleaned by a professional dry-cleaner or dry-clean in a self-service dry cleaning machine.

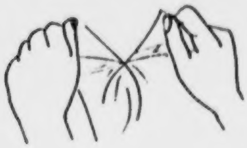
Interfacing, linings, and notions such as trims and zippers should also be preshrunk. Bias tape, however, should not be preshrunk. Trims and tapes may remain wrapped on their cardboard during preshrinking. The cardboard should be bent slightly to allow for shrinkage of the trim or tape. Trims and tapes should be placed in hot water for thirty minutes.

Straightening – Before the pattern is placed on the fabric, it is important to determine if the fabric is on-grain. A fabric is on-grain when the lengthwise yarns and crosswise yarns are at perfect right angles. A fabric is off-grain if the lengthwise yarns and crosswise yarns do not lie at right angles. Off-grain fabric must be straightened. If fabric is off-grain when garment pieces are cut out, the garment may pull to one side of the body and the hemline may hang unevenly.

Pattern pieces cut from fabrics that are off-grain are cut on the bias. ***Bias*** is any direction other than lengthwise or crosswise grain. ***True bias*** is at a 45° angle to any straight edge when grains are perpendicular. Fabric cut on the bias has more elasticity than fabric cut on-grain. Garment pieces cut on the bias have a tendency to sag and stretch. In addition, garment pieces that are cut on the bias do not hold their shape. Additional information regarding grain line is located in Chapter Six and Chapter Seven.



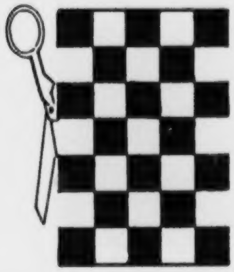
Before the grain of a fabric can be determined, the ends of the fabric should be straightened. When fabric is cut from the bolt, the edges are often uneven. When the edges of the fabric are uneven, it is difficult to check the grain. The edges of the fabric can be straightened by tearing the fabric ends, cutting along a prominent design line, or pulling a crosswise yarn.



The ends of some woven fabrics can be straightened by tearing the fabric. Firmly woven fabrics tear best. The following procedure should be observed when tearing fabric:

- Make a short cut through one selvage.
- Grasp the fabric on either side of the cut.
- Tear the fabric 5" or 6" at a time.
- Grasp the fabric near the end of the previous tear and tear 5" or 6" more.
- Continue tearing in 5" or 6" increments until the other selvage is reached.
- Cut through the other selvage rather than attempting to tear it.

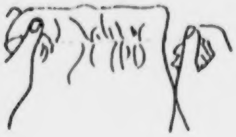
Most woven fabrics may be torn. Tearing should be done carefully, however, since some fabrics may snag, stretch, or be pulled off-grain.



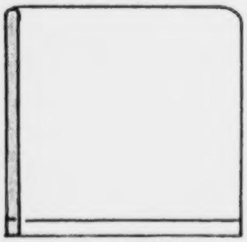
If the fabric has a prominent design such as a plaid, check, or other woven design, the fabric may be cut along one prominent line from selvage to selvage to straighten fabric ends. Cutting should begin at the selvage edge and continue along the selected line to the opposite selvage.

If a prominent design line is not clearly visible, one crosswise yarn should be pulled from the fabric to create a mark that can be used as a cutting line. Crosswise yarns can be removed from fabric in the following manner:

- Clip the selvage.
- Find the end of one crosswise yarn.
- Place the left hand on the fabric and pull the crosswise yarn gently and slowly.
- Push the fabric along the yarn gently.
- Alternate pulling the yarn and pushing the fabric until the opposite selvage is reached.

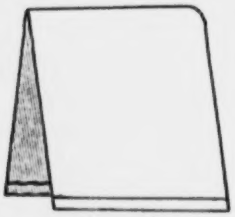


Once the crosswise yarn is removed, the fabric may be cut along the mark that has been created. Crosswise yarns can be pulled easily from loosely woven, soft, or stretchy fabrics. This method of straightening the ends of fabric is slower than tearing, but it is safer for delicate fabrics.



on-grain

Once the ends of the fabric are straight, the fabric can be checked to determine if it is on-grain. To check the grain of the fabric, the employee should fold the fabric lengthwise and match the selvages. The fabric is on-grain if the crosswise ends of the fabric match and are at right angles to the selvage. The fabric is off-grain if the edges do not match or the fabric puckers when the edges are matched.



off-grain

Off-grain fabrics can often be straightened. An effective way to straighten fabric is to fold the fabric in half so that the selvages are together and pull on the two opposite corners that are too short until the lengthwise and crosswise yarns form right angles when the fabric is folded. This method is easier if two people pull the fabric. One person can pull on each corner of the fabric. When the fabric is more than two yards in length, it is best to pull the fabric in one or two yard increments until the entire length is straightened. The fabric should not be overstretched since this can permanently damage the fabric.

Once the fabric is straightened, it should be placed on a flat surface and the alignment of the edges should be checked. If the fabric is still off-grain, it may be dampened and the procedure may be repeated. If the edges of the fabric are aligned within 1/2" to 1", the fabric has been straightened enough. The straightened fabric should be pressed before the pattern is placed.

Some fabrics cannot be straightened. For example, fabrics treated with heat-set finishes such as a permanent-press finish cannot be straightened. If a fabric cannot be straightened, it may be necessary to cut out the pattern pieces individually rather than laying out the entire pattern on the fabric. Each pattern piece should be placed on-grain and then cut out. When two pieces must be cut from one pattern piece, such as a bodice front left and bodice front right, the pattern piece should be inverted when cutting the second piece to avoid having both pieces identical (two bodice front left or two bodice front right).

Pattern Layout and Cutting

After the pattern is altered and the fabric is prepared, the pattern may be laid out. ***Layout*** is the placement of the pattern pieces on the fabric. The directions on the pattern guide sheet for proper cutting layout should be followed carefully or garment pieces may not fit together easily.

Before the pattern is laid out, all supplies needed for layout and pinning should be assembled. Supplies include pins, sharp cutting shears, a ruler, a tape measure, and the pattern guide sheet. Only the pattern pieces needed for the garment being constructed should be removed from the pattern envelope. Pieces that are printed on the same sheet should be cut apart. Pattern layout and pinning require concentration, so it is important to have all supplies assembled before any placement or pinning begins.

Folding Fabric – The cutting layout on the pattern guide sheet often shows the fabric folded. The fabric should be folded as shown in order for the correct number of garment pieces to be cut. Often, the cutting layout shows the fabric folded with the right sides facing in. When the right sides of the fabric are facing in, markings are easier to transfer and the right side of the fabric is protected from soil or dirt. Fabrics with prints, stripes, or plaids are usually folded with the right sides facing out so the fabric design can be matched easier.

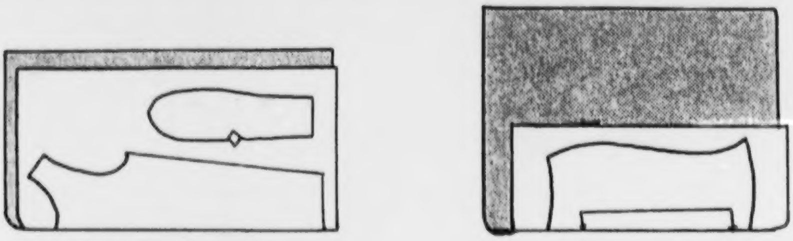
The right side of the fabric may be obvious if it has an obvious pattern, print, or nap. Sometimes, however, the right side of the fabric is not obvious. The right side of the fabric can sometimes be determined by looking at the way the fabric is rolled or folded on the bolt. On the bolt, the right sides of cotton and linen usually face out while the right sides of wool and most other fabrics usually face in. Also, the sides of the fabric can be compared. The right side may have more nap, a clearer print, more shine, or a more visible weave. If the right side of the fabric cannot be determined, either side may be designated as the right side. However, to avoid confusion, chalk marks may be placed on one side to designate it as the wrong side.

The cutting layout usually shows the fabric folded either lengthwise or crosswise. In some cases, the fold may be a double fold or a partial fold. Explanations of different types of folds are as follows:

- crosswise fold – The fabric is folded in half crosswise with the cut ends matched. The two layers of selvage should be even along each side.
- lengthwise fold – The fabric is folded in half lengthwise. The selvages and ends are matched.
- partial fold – The fabric is folded on the lengthwise grain. The fold is as wide as the widest part of the pattern piece.
- double fold – The fabric is folded twice along the lengthwise grain. The selvages usually meet in the center.

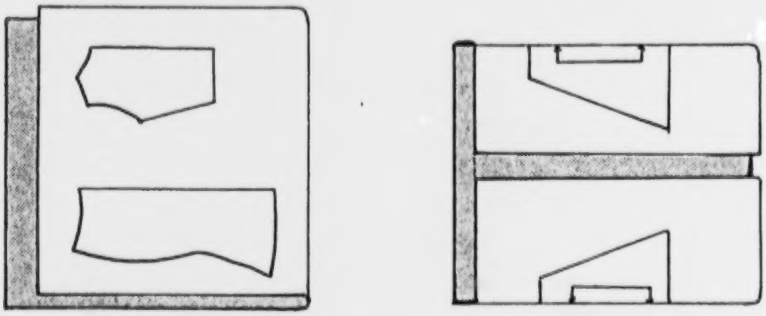
Examples of different types of folds are shown in figure 12.2.

Pattern Layouts for Special Fabrics – A fabric may have a design or texture that will affect the pattern layout procedure. Some fabrics have a design or texture that runs in only one direction. One-way designs have a distinct top and bottom. Both short-pile and deep-pile fabrics have a nap or texture that runs the entire length of the fabric. These fabrics must be cut with the design or nap running the same direction on all pieces. Extra fabric may be required when one-way or napped fabrics are used. If no information is given on the pattern envelope regarding the amount of napped or designed fabric required, the pattern pieces should be placed on the fabric to determine the amount needed. Additional information on napped fabrics and one-way designs is included in Chapter Seven.



Lengthwise Fold

Partial Fold



Crosswise Fold

Double Fold

Figure 12.2

Plaid fabrics, some striped fabrics, and fabrics with geometric designs also affect the pattern layout procedure. Pattern pieces must be aligned with the design of the fabric. Notches and dots on the pattern pieces can be used to line up special fabric lines during pattern layout. Plaid, striped, or geometric fabric should not be used if the pattern designates that it is not suitable for use with these fabrics. Plaid, striped, and geometric fabrics should also be avoided when a garment includes long design lines such as princess seams or horizontal darts. Additional information on pattern layouts for special fabrics is presented in table 12.1.

Pinning – Once the fabric is folded properly, any wrinkles should be smoothed. The fabric should be pinned together around the edges once the grain lines are straight. It is important to pin the fabric together since this prevents the fabric from moving as the pattern is laid out.

Before being placed on the fabric, each pattern piece should be trimmed. The number of pattern pieces to be laid out should correspond with the number of pieces shown on the pattern guide sheet. The pattern pieces should be placed on the fabric in the same position as shown on the cutting layout. The pieces should be placed as closely as possible without overlapping. Pattern pieces are usually placed with the printed side facing up. However, when pattern pieces are shaded on the cutting layout, they should be placed with the printed side facing down.

The grain line marking or fold line on a pattern piece should always be placed on the grain line of the fabric. Pattern pieces should not be angled in order to fit into a smaller area of fabric. This can result in part of the completed garment being off-grain. As each pattern piece is placed on the fabric, it should be pinned in place. Large pattern pieces marked with a place on the fold bracket should be pinned first according to the following guidelines:

- Place the fold line of the pattern piece along the fold of the fabric.
- Pin along the fold approximately every 6".
- Pin the corners of the pattern piece. Place pins diagonally in corners.
- Pin the edges of the pattern piece about every 6". Place pins perpendicular to the stitching lines pointing toward but not over the cutting lines.

Pattern Layouts for Special Fabrics

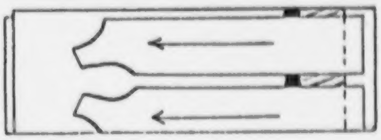
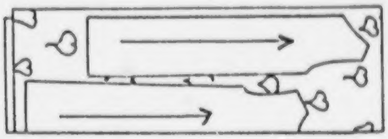
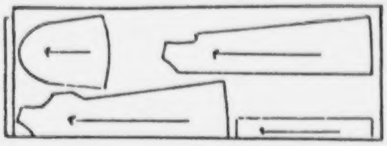
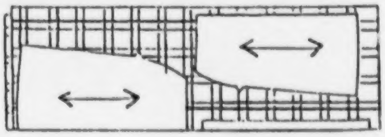
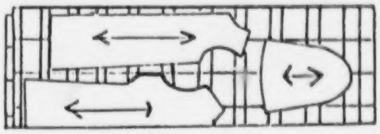
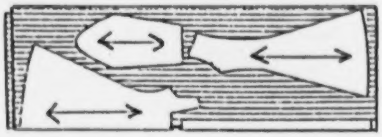
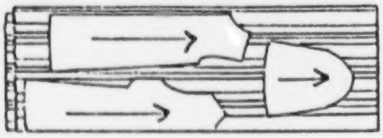
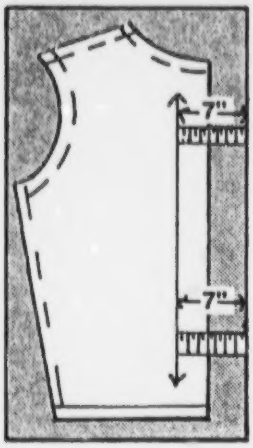
Border Prints All pattern pieces should be placed on the crosswise grain. Hemline markings and the lower edge of the border design should be matched. Additional pattern pieces may be placed on the fabric available above the design.	
Directional Prints The with nap cutting layout should be used. The design should be matched at the seam lines.	
Napped Fabric All pattern pieces should be placed facing in the same direction. To produce a richer color in corduroy and velvet, the nap should run up the garment. The with nap cutting layout should be used.	
Even Plaid Fabric The without nap cutting layout should be used. The center front and center back should be placed on a dominant line of the plaid. Plaids should be matched at the side seams and sleeves.	
Uneven Plaid Fabric The with nap cutting layout should be used. The center front and center back should be placed on a dominant line of the plaid. Plaids should be matched at the side seams and sleeves.	
Evenly Striped Fabric The without nap cutting layout should be used. The center front and center back should be placed on a dominant stripe when stripes are vertical. Stripes should be matched at the side seams and sleeves.	
Unevenly Striped Fabric The with nap cutting layout should be used. The center front and center back should be placed on a dominant stripe when stripes are vertical. Stripes should be matched at the side seams and sleeves.	

Table 12.1



After all pattern pieces marked with a place on the fold bracket are pinned, pattern pieces marked with the grain line marking should be pinned. These pieces should be pinned as follows:

- Pin each arrow of the grain line marking.
- Measure from the edge of the fabric to the point of each arrow.
- Unpin one end of the grain line marking and adjust until the measurements are the same.
- Repin when each end of the grain line marking is the same distance from the edge of the fabric.
- Pin the corners of the pattern piece. Place pins diagonally in corners.
- Pin the edges of the pattern piece approximately every 3" to 6". Place pins perpendicular to the stitching lines pointing toward but not over the cutting lines.

When all pattern pieces are pinned in place, they should be counted. The number of pieces on the fabric should correspond to the number shown on the cutting layout. In addition, the pieces should be checked to be sure they are positioned correctly and the grain lines are straight.

Cutting – When all pattern pieces are pinned to the fabric accurately, the garment may be cut out. The following guidelines should be observed when cutting:

- Use sharp, bent-handled shears to cut. Do not use pinking shears.
- Cut along the designated cutting lines on the pattern.
- Use long, even strokes when cutting. Use the tips of the shears to cut notches and other difficult areas.
- Keep the fabric flat on the cutting surface during the cutting process. Place the free hand on the fabric near the cutting area. Any lifting during cutting can cause distortions or inaccuracies.
- Cut with the grain line of the fabric. Some patterns have arrows or scissors printed on them to indicate the correct direction for cutting. Cut from the widest point to the narrowest point if the direction is not indicated.
- Cut notches outward from the marking. Cut double or triple notches as one by cutting straight across the top of the notches rather than between them.
- Leave the pattern pieces attached to the fabric after cutting until all markings are transferred.

Marking

Many of the pattern symbols on pattern pieces should be transferred to the fabric before the pattern is unpinned. These markings make it easier to assemble the garment. Markings should be visible when sewing, but they should not show on the outside of the completed garment. Markings can be made by using a tracing wheel and dressmaker's carbon paper, tailor's chalk, tailor's wax, or tailor's tacks. Sewing equipment and tools used when marking are discussed in Chapter Nineteen.

The following markings should be transferred to the fabric:

- construction markings such as dots, darts, tucks, and pleats
- placement lines for trims, buttons, buttonholes, and pockets
- fold lines
- center front and center back lines

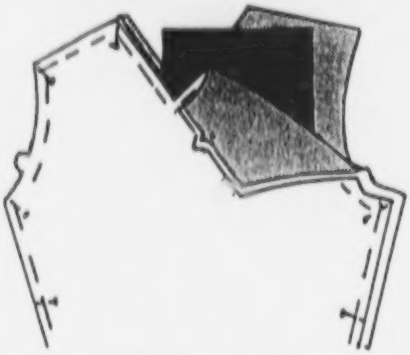
Hems and seam allowances are usually not marked. Hems are measured after the garment is completed, and seam allowances can be measured during sewing by following the seam guides marked on the throat plate of the sewing machine.

Tracing Wheel and Dressmaker's Carbon Paper – A tracing wheel and dressmaker's carbon paper can be used to transfer pattern symbols to most fabrics. Light-colored dressmaker's carbon paper should be used on white and light-colored fabrics. Dressmaker's carbon paper of contrasting colors should be used to mark dark fabrics. All markings should be transferred to the wrong side of the fabric so they will not be visible on the right side of the completed garment.

The following steps should be completed when marking fabric in which the wrong sides are together:

- Unpin the pattern piece in the area that will be marked. Leave other pins in place.
- Place the waxy side of the carbon paper between the fabric layers against the wrong side of the fabric. Use two layers of carbon paper if a double layer of fabric is to be marked. Two pieces of carbon paper may be used, or one piece may be folded so the color to be transferred is facing out.
- Roll the tracing wheel over the pattern symbols to be transferred. Mark each dot with an *x*. Use a ruler when marking straight lines, and mark the end of each dart with a straight line.

Figure 12.3 shows the correct method of inserting dressmaker's carbon paper when the wrong sides of the fabric are together.



Wrong Sides of Fabric Together

Figure 12.3

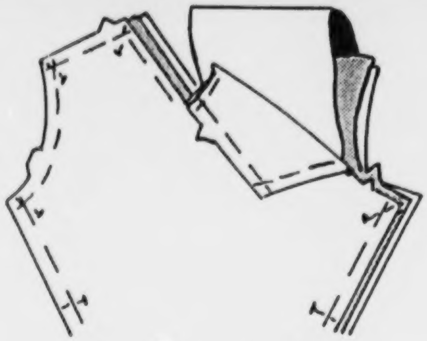
When the right sides of the fabric are together, the fabric should be marked as follows:

- Unpin the pattern piece in the area that will be marked. Leave other pins in place.
- Place the waxy side of the carbon paper between the fabric and the pattern with the waxy side down. Also place carbon paper under the bottom layer of fabric with the waxy side up (if there is a double layer of fabric). The carbon paper should be facing the wrong sides of the fabric.
- Roll the tracing wheel over the pattern symbols to be transferred. Mark each dot with an *x*. Use a ruler when marking straight lines, and mark the end of each dart with a straight line.

Figure 12.4 shows the correct method of inserting dressmaker's carbon paper when the right sides of the fabric are together.

When using a tracing wheel and dressmaker's carbon paper, the following guidelines should be observed:

- Choose a color of dressmaker's carbon paper that is dark enough to be seen on the wrong side of the fabric but light enough so it will not be noticeable on the right side of the fabric.
- Test the carbon paper selected on a scrap piece of fabric before using it on the actual garment piece.
- Place cardboard between the cutting surface and the fabric to prevent the tracing wheel from marring the surface. A magazine or other firm material also can be used.



Right Sides of Fabric Together

Figure 12.4

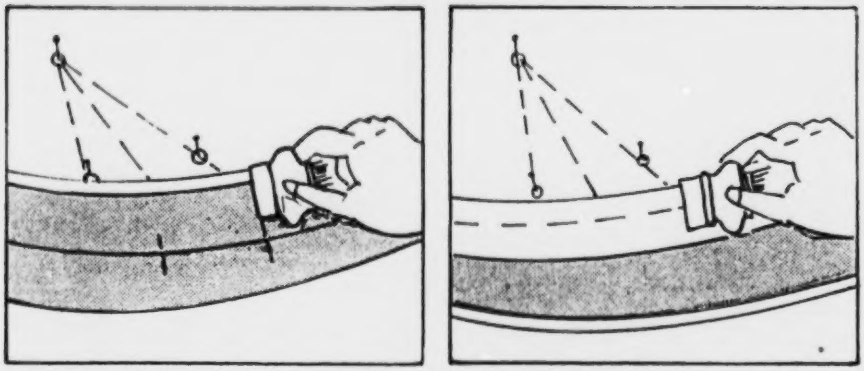
There are some disadvantages to using the tracing wheel and dressmaker's carbon paper. Markings may show on the right side of the fabric if the carbon paper color is too dark or if the markings are too heavy. Carbon paper markings are occasionally difficult to remove from some fabrics and may become permanent. Some fabrics can be punctured by the tracing wheel, and some markings may become distorted on stretch fabrics. If these problems occur, another method of marking should be used.

Tailor's Chalk – Tailor's chalk can be used on most fabrics. It is sometimes used to mark thick fabrics such as corduroy. Tailor's chalk leaves a thicker line than dressmaker's carbon paper and is less accurate. Only the wrong sides of fabric should be marked with tailor's chalk. Chalk markings sometimes are easily removed from some fabrics. Therefore, fabric marked with chalk should be handled carefully until the garment is completed.

Instructions for marking fabric with tailor's chalk are as follows:

- Unpin the pattern piece in the area to be marked. Leave other pins in place.
- Push pins through the pattern and fabric at each symbol to be marked.
- Lift up the pattern piece and mark at the site of each pin if the right sides of the fabric are together. If the wrong sides of the fabric are together, lift up the pattern piece and the top layer of fabric and mark at the site of each pin.
- Turn the fabric and pattern piece over and mark the other layer of fabric.
- Remove the pins and pin the pattern piece in place.

Tailor's wax, a dressmaker's marking pen, or a dressmaker's marking pencil also can be used for this marking method. Figure 12.5 shows the use of tailor's chalk.



Wrong Sides of Fabric Together **Right Sides of Fabric Together**

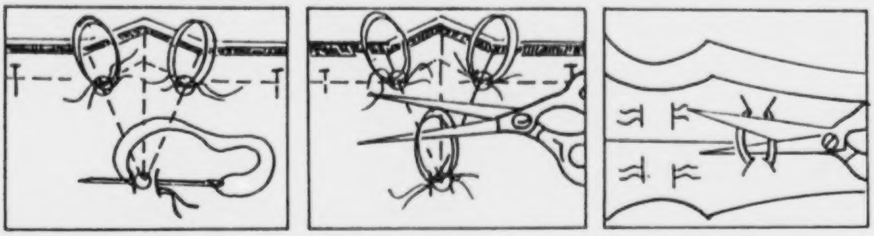
Figure 12.5

Tailor's Tacks – A ***tailor's tack*** is a loose, hand-sewn thread loop that is used to transfer pattern symbols to fabric. Tailor's tacks can be used to mark very thick fabrics, rough fabrics, sheer fabrics, loosely woven fabrics, or any fabric that cannot be marked clearly with other marking tools.

Guidelines for marking fabric with tailor's tacks are as follows:

- Do not unpin the pattern piece.
- Thread a needle with a double thickness of thread. Do not tie a knot in the thread.
- Make a loose stitch through the pattern piece and both layers of fabric at the selected pattern symbol.
- Leave at least 1" of thread extending from the pattern.
- Make a second loose stitch over the first stitch. Form about a 1" loop.
- Move from one marking to another when marking a series of dots, such as for a dart.
- Clip the thread loops on top of the pattern piece.
- Pull the fabric layers apart gently and clip the threads between the two layers.
- Remove the tailor's tacks when the markings are no longer needed.

This procedure can be followed when the right sides of the fabric are together and when the wrong sides of the fabric are together. Tailor's tacks are illustrated in figure 12.6, and they are also discussed in Chapter Nine.



Stitch through pattern and fabric at pattern symbol.

Clip thread loops.

Clip threads between fabric layers.

Figure 12.6

BASIC CONSTRUCTION TECHNIQUES

Basic construction techniques must be understood in order to construct garments according to the unit method of construction. Basic elements of construction include the following:

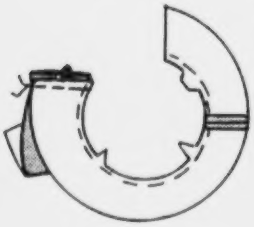
- backstitching
- basting
- buttonholes
- casings
- collars
- corners
- darts
- facings
- fasteners
- hand stitches
- hems
- inserts
- interfacing
- linings
- pleats and tucks
- pockets

- points
- seam finishes
- seams
- sleeves
- staystitching
- topstitching
- understitching
- waistbands
- zippers

Backstitching, basting, corners, darts, fasteners, hand stitches, inserts, pleats and tucks, points, seams, seam finishes, staystitching, topstitching, and understitching are discussed in Chapter Nine.

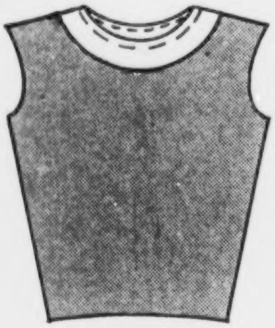
Facings

A ***facing*** is a piece of fabric that finishes a raw garment edge such as an armhole or neckline. A facing may be a fitted facing or a self-facing. A ***fitted facing*** is made of a separate piece of fabric that is cut the same shape as the area being faced. A fitted facing is sewn to the outer edge of the garment and turned in to finish the edge of the garment piece. A ***self-facing*** is cut in one piece with the garment piece and turned to the inside of a garment for a smooth finish. A facing should not be visible from the outside of the garment. Pattern pieces for constructing facings are usually included in the pattern envelope.



The following procedure can be used to construct a fitted facing:

- Staystitch the curved edges of the facing pieces.
- Pin the pieces of the facing with the rights sides together. Match notches.
- Stitch the seams of the facing. Trim and press seams open.
- Finish the outside edge of the facing by stitching or pinking.



After a facing is constructed, it is attached to the garment. A facing can be attached as follows:

- Pin the facing to the garment edge with the right sides together. For a self-facing, turn the facing to the outside of the garment with right sides together. Match notches.
- Stitch seams. Trim and grade the seam allowances. Notch or clip curved areas and trim corners close to the stitching.
- Press open the seam allowance. Press seam toward the facing.
- Turn the facing to the inside of the garment.
- Press along the seam line. Roll the seam toward the facing side.
- Understitch the seam to keep facing positioned inside the garment.

Interfacing

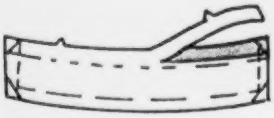
As discussed in Chapter Seven, interfacing is a piece of shaping fabric used to shape a section of a garment. Interfacing is placed between the facing and the garment to add firmness to an area and help an area retain its shape. Interfacing is used along garment edges, in collars, in cuffs, in waistbands, and in pockets. Interfacing should give support and body without changing the hand of the garment fabric.

A variety of interfacing is available. Interfacing may be knitted, woven, or nonwoven; light, medium, or heavy in weight; and fusible or nonfusible. Interfacing that is woven or knitted should be cut on the same grain line as the facing and the garment. Nonwoven interfacing does not have a grain line. Therefore, it may be cut to make the best use of the interfacing fabric. Fusible interfacing has heat-activated adhesive on one side that is activated when ironed. The heat from the iron melts the adhesive and adheres the interfacing to the garment. Nonfusible interfacing does not contain adhesive and must be stitched to the garment.

Interfacing should be chosen according to the weight of the garment fabric. In addition, interfacing should have the same care instructions as the garment fabric. If the garment fabric is washable, the interfacing should be washable. Information regarding the correct type of interfacing is usually included on the pattern envelope. However, if the pattern envelope does not provide adequate information, interfacing that is lighter in weight than the garment fabric should be used.

Patterns sometimes include separate pattern pieces for interfacing. If separate pattern pieces are not included for interfacing, the facing pattern pieces can be used. The following procedure can be used to attach nonfusible interfacing to a garment piece or facing piece:

- Trim the corners of the interfacing to eliminate bulky corners when the garment is turned right side out.
- Pin the interfacing to the wrong side of the garment piece or facing. Match notches and other markings.
- Stitch 1/2" from the garment or facing edge. Do not machine stitch along a folded edge. Catchstitch the interfacing to the garment or facing along a folded edge. Stitches should not show on the outside of the garment.
- Trim the interfacing close to the machine stitching.



Before attaching fusible interfacing, the interfacing should be tested on a scrap piece of the garment fabric. If the interfacing leaves an outline on the fabric or the texture of the fabric surface changes, the interfacing should be fused to the facing rather than to the garment. Fusible interfacing can be attached to a garment piece or facing piece as follows:

- Cut away all seam allowances on the interfacing.
- Place the adhesive side of the interfacing against the wrong side of the garment piece or facing piece.
- Fuse according to the manufacturer's instructions.

Linings

As discussed in Chapter Seven, a lining adds shape and wear to a garment and provides a finished look inside the garment. Lining also helps to prevent stretching and wrinkling of the outer garment. Lining fabrics are usually firmly woven with a smooth, slippery texture. The weight, color, and care of the lining fabric should be compatible with that of the garment fabric.

A lining is constructed separately from the garment and is then attached to the garment. The garment pattern pieces are often used to cut the lining. However, some patterns, such as jackets and coats, include separate pattern pieces for the lining. Lining pieces should be stitched together according to directions on the pattern guide sheet. It is not necessary to finish the seams of a lining unless the lining fabric will ravel easily.

A lining may be free hanging or attached. A ***free-hanging lining*** is not attached to the garment at the hem. It is hemmed separately from the garment and hangs freely in garments such as skirts and pants. An ***attached lining*** is sewn to the garment hem. Attached linings are often used in jackets, sleeves, and pants.

A free-hanging lining can be constructed and attached as follows:

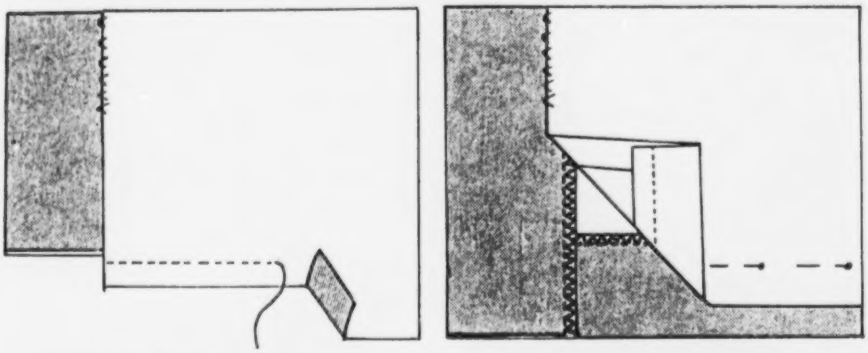
- Machine stitch darts and lining seams as they are in the garment.
- Join lining pieces. Leave the zipper area open.
- Press all seams and darts.
- Turn the lining right side out.
- Match the lining to the garment with wrong sides together and pin at the waistline.
- Turn under the seam allowances at the zipper opening. Match the folded edges to the zipper tapes and pin.

- Baste the lining to the garment 1/2" from the waistline edge.
- Attach the waistband and slipstitch the lining to the zipper tapes.
- Hem the lining and the garment separately. Make the hem of the lining 1" shorter than the hem of the garment. Ease the edge of the lining hem if necessary.
- Attach the lining to the garment with French tacks 1" long. Place one French tack at each seam.
- Slipstitch the remaining lining edge to the facing if the garment has a faced opening.

The following procedure can be used to attach a lining to a hem:

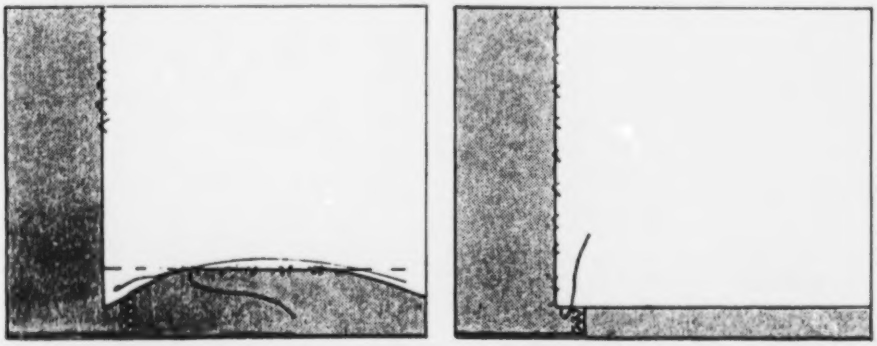
- Hem the garment.
- Place the lining in the garment with wrong sides together and pin.
- Sew the lining in place except for 6" at the lower edge.
- Trim the lining to 5/8" below the garment edge. Easestitch 1/2" from the hem edge if the lining hem must be eased.
- Fold the lining under until the fold is 1/2" from the garment edge.
- Pin the lining to the garment 1/2" above and parallel to the fold.
- Fold the lining back along the pinned line and slipstitch the edge of the lining to the garment hem.
- Slipstitch the remaining lining edge to the facing if the garment has a faced opening.

Once the lining is attached to the hem, the lining will form a pleat at the hemline. This pleat provides room for movement. Figure 12.7 illustrates the procedure for attaching a lining to a hem.



Sew lining in place, trim, and easestitch.

Fold lining under and pin.



Slipstitch edge of lining to garment hem.

Slipstitch remaining lining edge.

Figure 12.7

Seams

As described in Chapter Nine, a seam is a row or rows of stitching that hold(s) two or more layers of fabric together. Two types of basic seams are the gathered seam and the eased seam. Gathered and eased seams are used when two seam edges of unequal lengths are sewn together. Additional types of seams as well as seam finishes are discussed in Chapter Nine.

Gathered Seams – A ***gathered seam*** is formed when the edge of a long fabric piece is gathered up to match the second edge of a shorter piece of fabric, and the fabrics are then sewn together. Soft, even folds are created by gathering. Fabric is usually gathered to 1/2 or 1/3 its original width. Gathering is often used on garments at the waistline, yoke, or cuffs, and it can also be used to create ruffles.

Gathering is done after construction seams are stitched, finished, and pressed. Gathers are formed by pulling the bobbin thread and sliding the fabric along the thread. When stitched properly, a gathered seam retains fullness. The following procedure can be used to make gathers:

- Stitch two parallel rows in the seam allowance on the right side of the fabric requiring gathering. Leave long thread ends. Break the stitching at seams since it is difficult to gather through two thicknesses.
- Pin the stitched fabric edge to the corresponding straight fabric edge with right sides together. Match notches, center lines, and seams.
- Secure the bobbin threads at one end by wrapping around a pin in a figure-eight.
- Pull on the bobbin threads gently while sliding the fabric along the threads to gather half the section.
- Secure the bobbin threads around a pin once uniform gathers are created and the gathered section fits the adjoining edge of fabric.
- Untie the bobbin threads and repeat the gathering process on the ungathered section of fabric.
- Adjust gathers uniformly and pin at frequent intervals once the entire gathered edge matches the straight edge.
- Stitch along the seam line with the gathered side up. Use both hands to hold the gathers evenly on both sides of the needle to prevent folds or pleats from forming.

Figure 12.8 illustrates this procedure for gathering a seam.

Eased Seams – An ***eased seam*** is used to join the edges of two plies of fabric that are slightly different in length without forming gathers. The extra length is eased so that puckers and gathers are not created. Easing is used to shape fabric over curved areas of the body such as sleeves, shoulder seams, waistbands, and yokes. Eased seams are often used to attach set-in sleeves. When stitched properly, an eased seam has subtle shaping and is smooth and unpuckered.

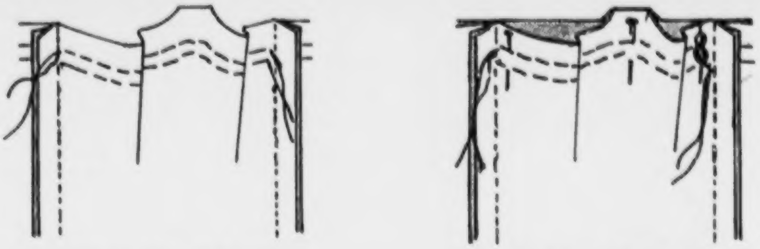
A seam can be eased as follows:

- Pin the right sides of the fabric together with the longer piece on top. Pin at each seam and at the notches.
- Place a pin halfway between the pins at the notches.
- Spread the extra fabric equally on each side of each pin. Place additional pins halfway between these pins.
- Continue pinning until pins are about 1/2" apart.
- Stitch with the longer seam on top.

The procedure for gathering a seam can be followed when a greater amount of fullness must be eased.

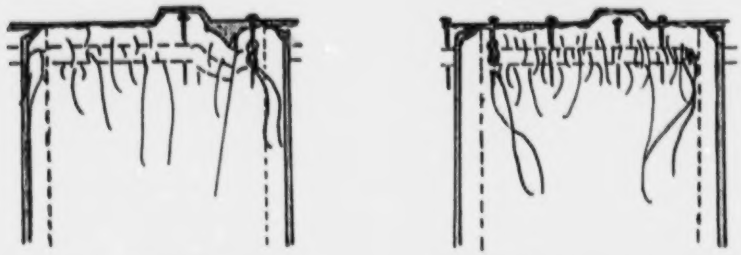
Casings

A ***casing*** is a fabric tunnel that holds elastic or a drawstring in place. Casings are used on waistlines, necklines, sleeves, and hemlines to help control fullness.



Stitch two parallel rows on the right side of the fabric.

Pin fabric with right sides together and secure bobbin threads around a pin.



Pull on the bobbin threads and slide the fabric along the threads.

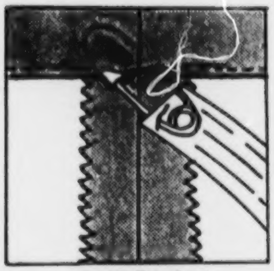
Adjust gathers uniformly and pin at frequent intervals.

Figure 12.8

The elastic or drawstring allows the garment to be adjusted. There are two types of casings. A ***self-casing*** is formed by folding the edge of a garment over and stitching it into place. Self-casings are the easiest type of casing to make and use. An ***applied casing*** is formed by sewing a separate piece of fabric to the edge of a garment or within a garment. Single-fold bias tape can also be used to construct an applied casing. An applied casing is usually attached to the inside of a garment, but it is sometimes attached to the outside of a garment for decorative purposes. Applied casings are suitable for garments made of bulky fabrics. To allow for ease of movement, both types of casings should be about 1/4" wider than the drawstring or elastic that will be enclosed.

A self-casing can be constructed as follows:

- Fold the raw edge of the fabric under 1/4" and press.
- Fold the casing to the inside of the garment along the fold line. Press and pin in place.
- Edgestitch along the pinned edge. Leave a 2" opening unstitched at the side seam or center back to insert the elastic.
- Cut elastic to the correct length. Measure the body at the point where the casing will fit and add 1" to determine the length to cut the elastic.
- Pull the elastic through the casing using a safety pin or bodkin. A bodkin is a blunt, needle-like tool used to pull material or elastic through a casing.
- Overlap the ends of the elastic 1" and pin together.
- Check the fit of the garment and adjust the elastic if necessary.
- Stitch the ends of the elastic together.
- Stitch the casing closed. Stretch the elastic while stitching.



Self-Casing

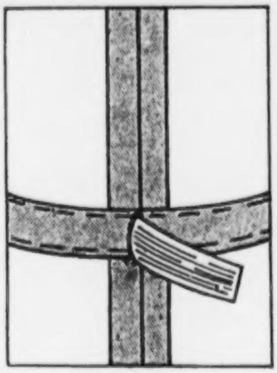
A procedure such as the following can be used to construct an applied casing:

- Cut a strip of fabric 1/2" longer than the finished casing length and 1" wider than the width of the elastic.
- Fold in the edges of the fabric 1/4" and press.

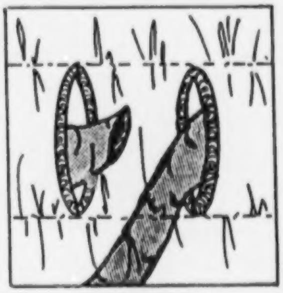
- Edgestitch the folded ends.
- Pin the casing in place on the garment.
- Edgestitch along the edge of the casing. Leave a 2" opening unstitched at the side seam or center back to insert the elastic.
- Insert the elastic as described above.
- Stitch the casing closed.

The procedures for constructing drawstring casings are basically the same as the procedures for constructing elastic casings. The main difference is that an opening must be left in the casing for the drawstring. The opening for a drawstring can be on the outside or the inside of a garment. The opening can be two buttonholes or a slit in a seam. The opening should be reinforced with fusible interfacing or a small piece of fabric.

Buttonhole openings should be constructed in the outer fabric before the casing is stitched. A seam opening is made as the seam is stitched. The seam should be left open between markings and reinforced with backstitching. A safety pin can be used to pull the drawstring through the casing. The ends of the drawstring should be knotted so the drawstring will not come out during washing or wearing.



Applied Casing within Garment



Casing with Buttonhole Opening

Hems

A ***hem*** is a finish made by folding the fabric of a garment to a desired length to finish the bottom edges of shirts, sleeves, dresses, skirts, jackets, and pants. When a garment is hemmed properly, the stitches should not show on the outside of the garment, the hem edge should be smooth and flat, and the garment should hang evenly on the body. In some cases, the hem will show on the outside of the garment if it is part of the garment design.

Most hems are made by turning the raw edge of the fabric to the inside of the garment and stitching or fusing it in place. Before a hem can be stitched, however, it must be marked and turned up. A hem length should be chosen that is appropriate for the client's body build and current fashion trends. The client should put on the garment and stand straight with weight on both feet. Clothing and accessories that will be worn with the completed garment should be worn when the hem is marked.

Before the hem is marked, the garment should hang on a hanger for twenty-four hours. Hanging allows any bias areas of the garment to stretch and prevents the finished hemline from sagging. Procedures for marking the hems of different types of garments are as follows:

- dresses and skirts – Use a ruler, yardstick, or skirt marker to measure the distance from the floor to the desired finished hem length. Place chalk marks or pins in the garment parallel to the floor. Chalk marks or pins should be about 2" to 3" apart.
- pants and slacks – Fold one pants leg under until the length touches the top of the shoe in the front and pin. The back should be about 1/2" longer than the front.
- jackets – Fold the fabric under and pin according to the hemline marked on the pattern. Adjust as needed.
- sleeves – Have the client bend the arm so that the hand is at the center of the waistline. Fold the edge of the sleeve under until it covers the wrist bone and pin.

Figure 12.9 shows examples of how to mark hems on different types of garments.

After the hem is marked, it should be turned up and trimmed. Hems are often trimmed to 2" to 3" in depth. This depth adds to the weight of the hemline and helps it to fall evenly. When determining the width of a hem, the weight of the

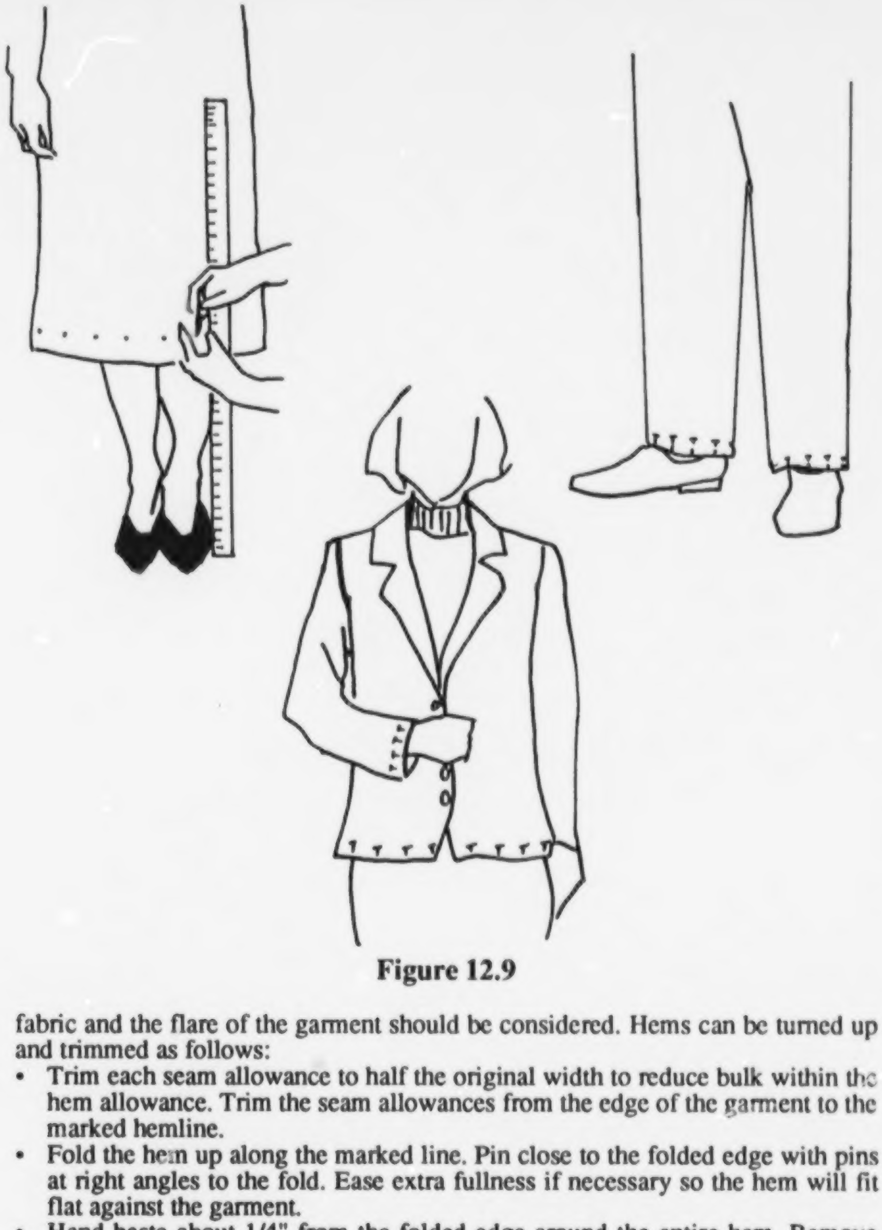


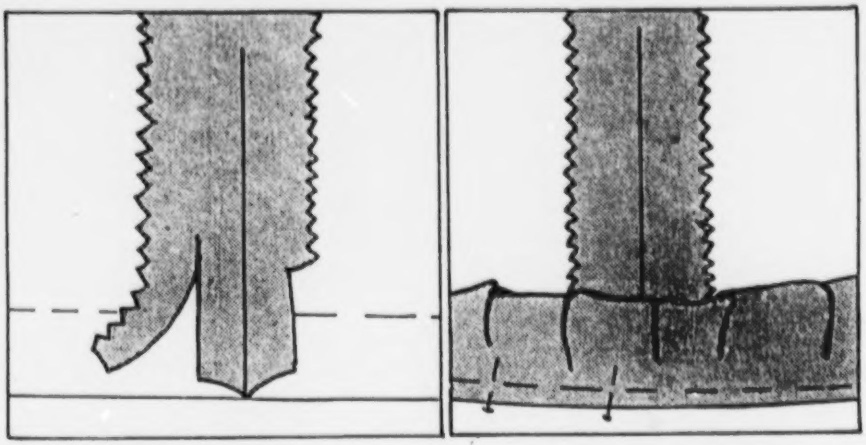
Figure 12.9

fabric and the flare of the garment should be considered. Hems can be turned up and trimmed as follows:

- Trim each seam allowance to half the original width to reduce bulk within the hem allowance. Trim the seam allowances from the edge of the garment to the marked hemline.
- Fold the hem up along the marked line. Pin close to the folded edge with pins at right angles to the fold. Ease extra fullness if necessary so the hem will fit flat against the garment.
- Hand baste about 1/4" from the folded edge around the entire hem. Remove pins.
- Determine how deep the hem should be. Curved edges usually have a narrower hem width than straight edges.
- Use a hem gauge or ruler to measure the width of the desired hem. Use pins or tailor's chalk to mark the hem width.
- Trim the excess hem allowance along the marked line.

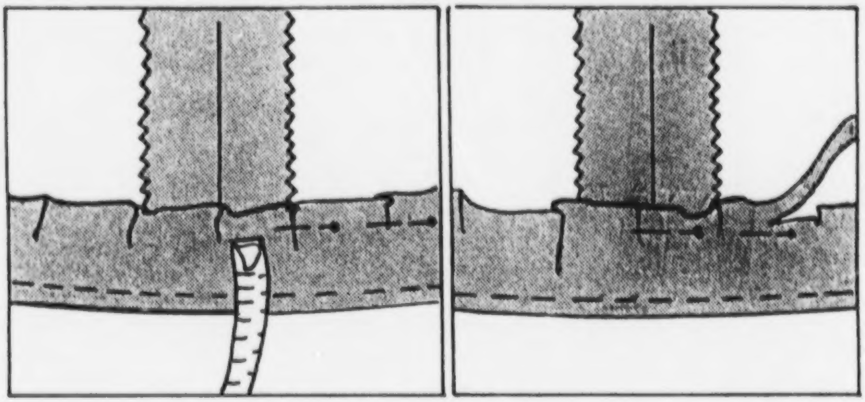
Figure 12.10 illustrates the procedure for turning up and trimming a hem.

After the hem has been turned up, trimmed, and eased (if necessary), it should be finished before being stitched to the garment. A ***hem finish*** is a treatment applied to the raw edge of the fabric to keep the fabric from raveling and provide support for the hemming stitches. Finishes used for seams can also be used to finish hems. The zigzag seam finish, pinked and stitched seam finish, and clean finish can be used to finish hems. These seam finishes are described in Chapter Nine.



Trim seam allowance to half of original width.

Fold hem, pin, and baste.



Measure and mark desired width of hem.

Trim excess hem allowance.

Figure 12.10

The seam tape finish is often used to finish hems. A ***seam tape finish*** is made by stitching seam tape, bias tape, or lace to the raw edge of the hem. This type of finish is suitable for straight hems on medium-weight to heavy-weight woven fabrics. A seam tape finish is produced by placing the tape 1/4" over the raw edge of the hem and stitching.

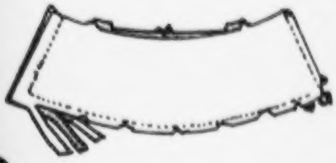
A hem can be attached to a garment by machine, by fusing, or by hand. The pattern guide sheet should be referred to when determining the type of hem to use. Machine stitching is often used to hem the bottom of shirts and blouses. Machine stitching also can be used for both decorative and invisible stitching. Some sewing machines have a built-in blindstitch for hemming. ***Fusing*** is the process of placing fusible web between the garment and the hem and pressing. The fusible web melts when heated and adheres the hem to the fabric. A fused hem can be altered by pressing the hem with steam until the fabric layers can gently be pulled apart.

Most hems are sewn by hand. The catchstitch, slipstitch, vertical hemming stitch, or blind hemming stitch can be used to attach a hem to a garment. These stitches are explained in Chapter Nine.

Collars

As discussed in Chapter Sixteen, a collar is a piece of fabric attached to the neckline of a garment. A collar serves as a frame for the face and directs the eye toward the face. Collars are usually flat, standing, shirt, or rolled and made of two layers of fabric and one layer of interfacing to help them keep their shape.

A ***flat collar*** lies flat against the garment when attached. Flat collars may have pointed corners or rounded edges. A ***standing collar*** is made of a band that stands straight up. A standing collar may fold over to create a turtleneck. A ***shirt collar*** contains a separate band that attaches the collar to the neckline of the garment. A ***rolled collar*** stands up at the back of the neck and then rolls back onto the garment. Rolled collars are often used on blouses and suit jackets. Various styles of collars are illustrated in Chapter Sixteen.



The following basic procedure can be used to construct many collar styles:

- Stitch or fuse interfacing to the collar facing or the under collar. Refer to the section on interfacing included in this chapter.
- Pin the collar pieces with right sides together or the collar and the facing pieces with right sides together. Follow the instructions on the pattern guide sheet.
- Stitch the outer edge of the collar. Reinforce points or corners.
- Trim and grade the seam allowances. Notch or clip curved areas and trim corners close to the stitching to form sharp points.
- Press the seam open and turn the collar to the right side. Pull points out gently.
- Press the outer seam of the collar and roll it slightly to the collar underside.
- Understitch the undercollar to the seam allowance or topstitch around the edge of the collar.

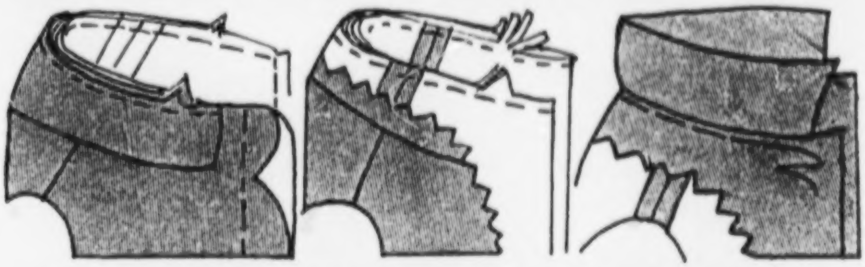
After a collar is constructed, it must be attached to the garment. There are different methods of attaching collars to garments. The method used depends on the type of collar and whether the garment has a neck facing. The following method can be used to attach a collar with a neck facing; however, the instructions on the pattern guide sheet usually should be followed when attaching collars to garments:

- Stitch facing sections together and complete facing construction. Refer to the section on facings included in this chapter.
- Staystitch the neckline of the garment. Clip the neck edge up to the staystitching.
- Machine baste the neckline edge of the upper and the under collar together.
- Place the collar underside against the right side of the garment. Pin the collar to the neckline. Match notches and markings.
- Stitch inside the seam line in the seam allowance.
- Pin the facing to the neckline with the right side of the facing and the right side of the collar together. Match seam lines and markings.
- Stitch through all layers of the collar, neckline, and facing. Trim, grade, and clip the seam allowances.
- Turn the facing to the inside of the garment and press.
- Understitch the facing to the neckline seam allowances.
- Tack the edge of the facing to the shoulder seam allowances.

An example of this procedure is included in figure 12.11.

Collars without neck facings can be attached as follows:

- Staystitch the neckline of the garment. Clip the neck edge up to the staystitching.



Pin collar to neckline with collar underside against right side of garment.

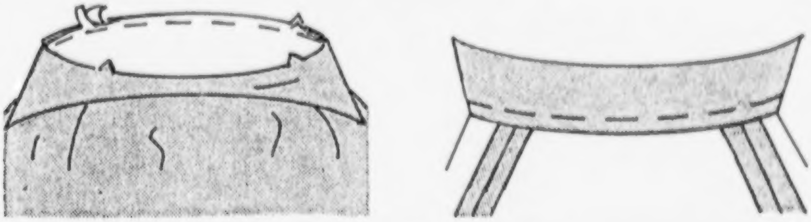
Stitch facing and collar to neckline.

Turn facing to the inside, understitch, and tack in place.

Figure 12.11

- Place the right side of the under collar against the right side of the garment. Pin the collar to the neckline. Match notches and markings.
- Stitch the under collar to the garment. Trim, clip, and press the seam toward the collar.
- Turn in the seam allowance of the upper collar or band. Press and trim the seam allowance to 1/4".
- Pin the folded edge over the neckline seam and slipstitch by hand or machine stitch close to the edge.
- Press the seam and the collar at the neck edge.

Figure 12.12 shows an example of this procedure.



Place right side of under collar against right side of garment, pin, and stitch.

Turn in seam allowance of upper collar, pin over neckline seam, and stitch.

Figure 12.12

Sleeves

As discussed in Chapter Sixteen, there are three basic types of sleeves: kimono, raglan, and set-in. Each of these sleeve styles has a different look and method of construction. The kimono sleeve is cut in one piece with the front and the back of the garment. The raglan sleeve is cut separately and attached to the garment by a diagonal seam that extends from the armhole to the neckline. The set-in sleeve is constructed separately and attached to the armhole of the garment.

Kimono Sleeves – The kimono sleeve extends from the front and back of the garment without armhole seams. When constructing a kimono sleeve, it is important to clip and reinforce the underarm area. Since a sharp curve is formed by the underarm seam, the seam must be clipped so it will lie flat. Extra stress is placed on the underarm area when the garment is worn. Therefore, the clipped underarm area must be reinforced so the stitches do not break.

A kimono sleeve can be constructed as follows:

- Pin the front and back pieces of the garment with right sides together.

- Stitch the shoulder seam and press open.
- Stitch the underarm seam.
- Reinforce the underarm seam with a second row of stitching 3/8" from the outer edge or stitch a piece of seam tape over the underarm seam.
- Clip along the curve of the seam as close as necessary. Press the seam open.

Raglan Sleeves – A raglan sleeve is attached to a garment by a continuous diagonal seam that runs down from the front neckline to the underarm, and up to the back neckline. Since a raglan sleeve covers the entire shoulder, a shaping device such as a dart is included at the top of the sleeve to help the sleeve fit over the curve of the shoulder.

A procedure for constructing a raglan sleeve is as follows:

- Stitch the shoulder dart on the sleeve. Slash the dart and press open.
- Pin the diagonal seams on the sleeve to the garment with right sides together. Match notches, markings, and underarm seams.
- Stitch the diagonal seams.
- Reinforce the seams by stitching the underarm area 3/8" from the outer edge.
- Clip inside curves and notch outside curves. Press seams open.
- Stitch the side seam of the garment and the underarm seam of the sleeve.

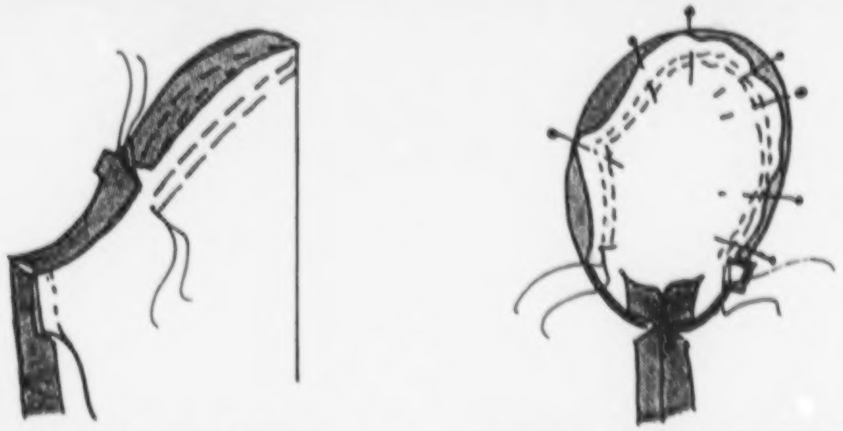
Set-In Sleeves – Set-in sleeves are commonly used in garments, but they are more difficult to construct than kimono or raglan sleeves. A set-in sleeve is attached to a garment at the armhole. A set-in sleeve is always larger than the armhole of the garment. This extra fullness allows the sleeve to fit over the top curve of the arm and provides movement. For garments designed to be smooth at the seam line, the extra fullness of the sleeve must be eased into the armhole without gathers or puckers forming. Sleeves that are not designed to be smooth at the seam line, such as a puffed sleeve, may be gathered at the seam line. The gathers should be even along the upper curve.

A set-in sleeve can be constructed and attached as follows:

- Easestitch between the notches on the sleeve cap 5/8" from the edge.
- Easestitch a second row 3/8" from the edge.
- Pin the sleeve with right sides together and stitch the underarm seam. Press the seam open.
- Insert the sleeve into the armhole with right sides together. Pin at matched markings.
- Draw up sleeve fullness by pulling the bobbin thread ends. Distribute fullness evenly along the sleeve cap.
- Pin sleeve to armhole at 1/2" intervals. Hand baste using small stitches.
- Examine the right side of the sleeve for puckers. If puckers appear, remove the basting and place the sleeve over a press mitt or tailor's ham. Press along the sleeve cap on the right side and shrink out as much puckering as possible.
- Place the sleeve in the armhole and baste.
- Begin stitching the sleeve to the armhole at the underarm seam with the sleeve side up.
- Trim the cross seam allowances diagonally at the shoulder and underarm.
- Stitch a second row within the seam allowance 1/4" from the first row of stitches.
- Trim seam allowances close to the second row of stitching.
- Turn seam allowances toward the sleeve.

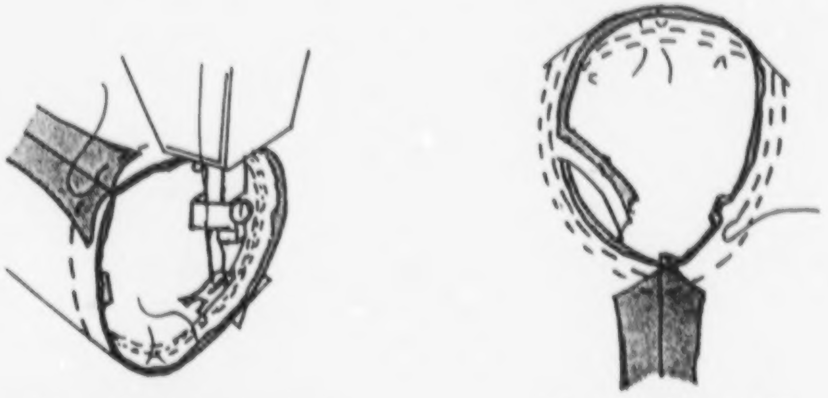
This procedure for constructing and attaching a set-in sleeve is illustrated in figure 12.13.

Sleeve Finishes – The method in which the edge of a sleeve is completed is known as the ***sleeve finish***. There are several types of sleeve finishes that range from simple hems to cuffs. Regardless of the type of sleeve finish, the hemline of the sleeve should be marked at a length that is attractive on the wearer, pressing should be accurate, and bulk should be reduced wherever possible.



Easestitch two rows between the notches on the sleeve cap.

Insert the sleeve into the armhole and pin at matched markings and draw up fullness.



Stitch the sleeve to the armhole beginning at the underarm seam.

Trim seam allowances.

Figure 12.13

Common types of sleeve finishes include the fold-up cuff, the band cuff, and the buttoned cuff. The ***fold-up cuff*** is made of a deep hem that is folded to the right side of the garment and tacked in place at each seam. The fold-up cuff does not require a placket or a fastener. The ***band cuff*** is formed by stitching an interfaced band to the edge of the sleeve. Since the band cuff fits the wrist closely, the opening must be large enough for the hand to slip through. A ***buttoned cuff*** fits snugly around the wrist and is made with a placket that is secured with a fastener such as a button. As discussed in Chapter Nine, a placket is a partial opening in a garment in an area such as the neckline, waistline, or sleeve. The placket provides additional space for movement of the hand and arm through the cuff.

Waistbands

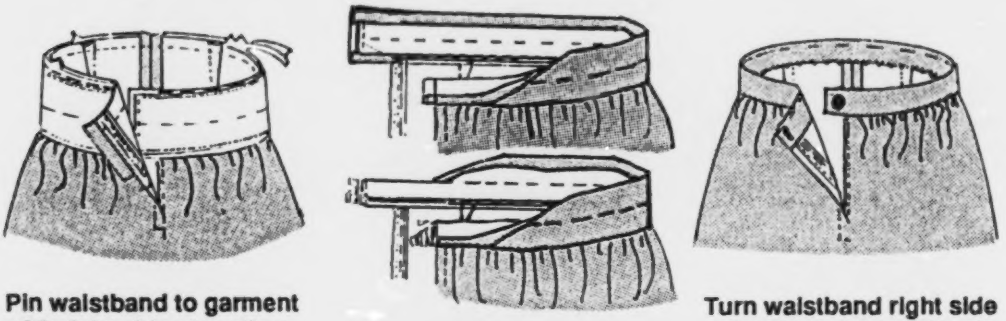
A ***waistband*** is a band of fabric attached to the waistline of skirts, pants and slacks, and shorts. A waistband usually has one end that laps over the other end so that a fastener can be applied to keep the waistband closed. The ***overlap*** is the end of the waistband that falls on the top, and the ***underlap*** is the end of the waistband that falls underneath the overlap.

A waistband may be attached to a garment in many different ways. On many garments, the waistband is attached in one piece after the zipper is attached and all other vertical seams are stitched. On some men's and boy's garments, the waistband is attached in two pieces. The center back seam is left open and a waistband piece is attached to each half of the garment. After the waistband pieces are attached, the center back seam is stitched. Since the methods for attaching waistbands differ, directions on the pattern guide sheet should be followed.

The plain waistband and topstitched waistband are two common types of waistbands. A ***plain waistband*** is stitched to the right side of the garment and turned to the inside and stitched. A ***topstitched waistband*** is stitched to the wrong side of the garment and turned to the outside and topstitched in place. A plain waistband can be constructed as follows:

- Interface the waistband if the fabric is lightweight.
- Press the unnotched fabric edge under 1/2". Trim the seam allowance to 1/4" on this unnotched edge.
- Pin the waistband to the garment with right sides together. Match notches. Ease the garment to the waistband between markings.
- Stitch the waistband to the garment.
- Trim interfacing close to stitching and trim and grade seam allowances. Press the seam flat and then toward the waistband.
- Fold each end of the waistband along the fold line with right sides together and pin.
- Stitch each end. Trim and grade seam allowances, clip corners, and press.
- Turn the waistband right side out. Fold to the inside along the fold line and pin over the seam.
- Slipstitch the waistband in place.
- Attach fasteners.

Figure 12.14 illustrates the procedure for constructing a plain waistband.



Pin waistband to garment with right sides together and stitch.

Fold each end of the waistband along the fold line with right sides together, pin, and stitch. Trim and grade seam allowances.

Turn waistband right side out, fold to the inside, pin, and slipstitch in place.

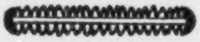
Figure 12.14

Buttonholes

Bound Buttonhole

A ***buttonhole*** is a slit or loop through which a button can be fastened. Buttonholes may be bound or worked. A ***bound buttonhole*** is made of fabric strips that are cut and sewn into place before the facing is attached. Bound buttonholes are often used on tailored jackets and coats. A ***worked buttonhole*** consists of stitches around the edges of the buttonhole area. Worked buttonholes are constructed after a garment is completed, and they may be machine-worked or hand-worked.

A ***machine-worked buttonhole*** is often stitched with a zigzag machine stitch. Machine-worked buttonholes are suitable for firmly woven or knitted fabrics that are medium-light to medium-heavy in weight. Machine-worked buttonholes should not be used on fabrics that are very lightweight or on heavy, loosely woven fabrics that may fray.

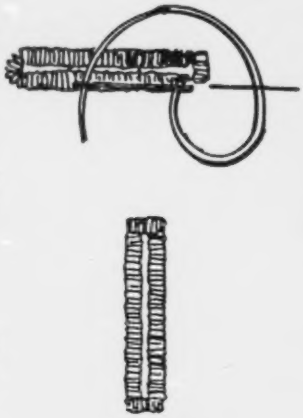

Machine-Worked Buttonhole

Some sewing machines have a buttonhole attachment that is used to make machine-worked buttonholes. On sewing machines without a buttonhole attachment, the zigzag stitch width is changed to form a machine-worked buttonhole. Machine-worked buttonholes can be constructed as follows:

- Mark the placement of the buttonhole on the right side of the fabric.
- Stitch the buttonhole. Since sewing machines differ, follow the instructions in the sewing machine manual for constructing buttonholes.
- Place one pin across each end of the buttonhole.
- Use small, sharp scissors to cut the buttonhole open. Insert the blade of the scissors in the center of the buttonhole; cut in both directions from the center.

A ***hand-worked buttonhole*** is stitched by hand using the buttonhole stitch as discussed in Chapter Nine. Hand-worked buttonholes are not as durable as machine-worked buttonholes, and they are usually used on fabrics on which machine-worked buttonholes are not suitable. Hand-worked buttonholes can be constructed as follows:

- Mark the placement of the buttonhole on the right side of the fabric.
- Stitch around the buttonhole 1/8" from the buttonhole mark. Round the end of the buttonhole nearest the garment edge when constructing a horizontal buttonhole. Make both ends of the buttonhole square when constructing a vertical or diagonal buttonhole.
- Cut the center of the buttonhole open.
- Overcast the edges of the buttonhole.
- Stitch the buttonhole using the buttonhole stitch. Work from right to left around the opening. Begin stitching at the straight end on a horizontal buttonhole. Begin stitching at either end on a vertical or diagonal buttonhole.
- Make fan-shaped stitches at the rounded end of a horizontal buttonhole. Make a bar tack across the end of a vertical or diagonal buttonhole.
- Continue stitching along the edge of the buttonhole to the end. Make a bar tack across the end of a horizontal, vertical, or diagonal buttonhole.


Hand-Worked Buttonholes

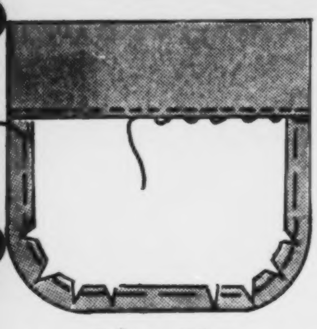
Pockets

A ***pocket*** is a bag or pouch sewn into or on clothing. Pockets may be functional or decorative. There are many types of pockets. Some pockets are located inside a garment, some are stitched on the outside of a garment, and some may have a flap over the top of the pocket. Two common types of pockets are the patch pocket and the seam pocket.

Patch Pockets – A ***patch pocket*** is a piece of fabric that is sewn to the outside of a garment. A patch pocket may be any shape and may be lined or unlined. Patch pockets may be plain, decorated, made of the same fabric as the garment, or made of contrasting fabric. When the design of a garment calls for a patch pocket, a pattern piece for the pocket is usually included in the pattern envelope.

An unlined patch pocket often includes a self-facing at the opening edge. The facing is turned to the inside during construction. Unlined patch pockets can be constructed as follows:

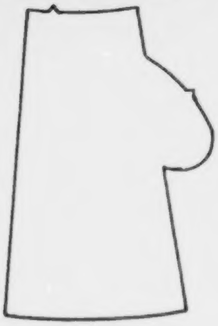
- Turn under and edgestitch the raw edge of the pocket facing.



- Fold the facing to the right side of the pocket along the fold line.
- Stitch each side of the facing on the seam line.
- Trim the seam allowance of the pocket to 3/8". Cut diagonally across each corner at the top of the pocket.
- Turn the facing to the wrong side of the pocket and pull the corners out.
- Press facing and seam allowances. Notch round corners; miter square corners.
- Baste around the edge of the pocket and slipstitch the facing to the pocket.

When construction of a patch pocket is completed, the pocket can be attached to the garment. The pocket should be pinned to the right side of the garment and basted in place. The pocket can be stitched by machine or by hand. Machine stitches should be as close as possible to the edges of the pocket. An uneven slipstitch should be used when sewing the pocket on by hand.

Seam Pockets – A ***seam pocket*** is a pocket sewn into the side seam or side front seam of a garment. Seam pockets are used in skirts, slacks or pants, shorts, and dresses. An ***all-in-one seam pocket*** is cut as part of the garment front and back. A ***separate seam pocket*** is cut from a separate pattern piece and stitched to the side seam of the garment. A separate seam pocket should be constructed from the same fabric as the garment if the garment fabric is lightweight and a solid color. If the garment fabric is heavy or bulky, the pocket pieces should be cut from a lightweight fabric that matches or blends with the garment fabric.

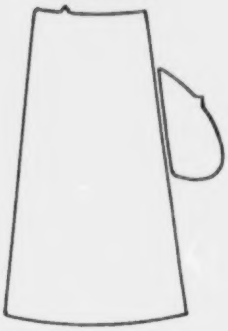


All-In-One Seam Pocket

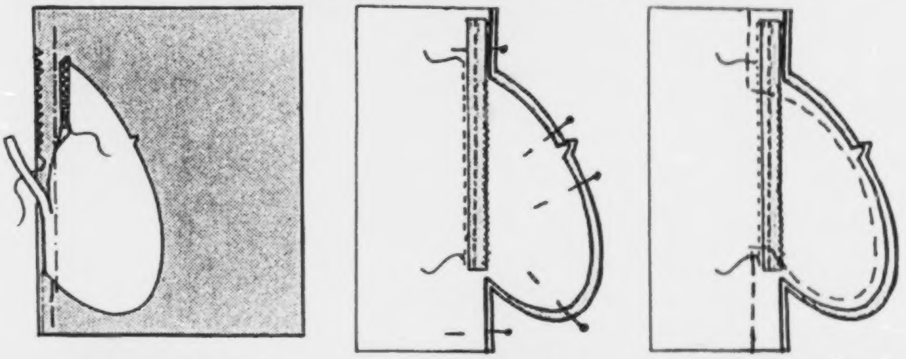
A separate seam pocket can be constructed as follows:

- Stitch a piece of seam tape along the front and back fold line or seam line of the garment to reinforce the pocket opening.
- Pin one pocket piece to the front garment piece with right sides together. Match markings and stitch.
- Pin the other pocket piece to the back garment piece with right sides together. Match markings and stitch.
- Press seam allowances toward pocket pieces.
- Pin the garment front to the garment back with right sides together and pockets extended. Match markings.
- Baste the pocket opening.
- Stitch directionally along the seam and around the pocket in one step. Reinforce the corners of the pocket.
- Press seam allowances flat.
- Turn the pocket toward the front of the garment; clip the back seam allowance above and below the pocket. Press the garment seam allowances open.
- Finish seam allowances and remove basting.

Figure 12.15 illustrates the procedure for constructing a seam pocket.



Separate Seam Pocket



Pin pocket piece to garment piece and stitch.

Pin garment front to garment back. Baste pocket opening.

Stitch directionally along seam and around pocket.

Figure 12.15

An all-in-one seam pocket can be constructed using the same method as above. The only difference is that the pocket pieces do not have to be stitched to the garment front and the garment back since they are cut as part of the garment.

Zippers

As presented in Chapter Nine, a zipper is a widely-used fastening device for women's, men's, and children's garments. Conventional, separating, and invisible zippers are available. Information about specific types of zippers and terms related to zippers are included in Chapter Nine.

Conventional Zippers – Zippers can be attached to garments in a variety of ways. ***Zipper application*** is the method by which a zipper is attached. There are three basic zipper applications for the conventional zipper. A conventional zipper may have a centered zipper application, a lapped zipper application, or a fly-front zipper application.

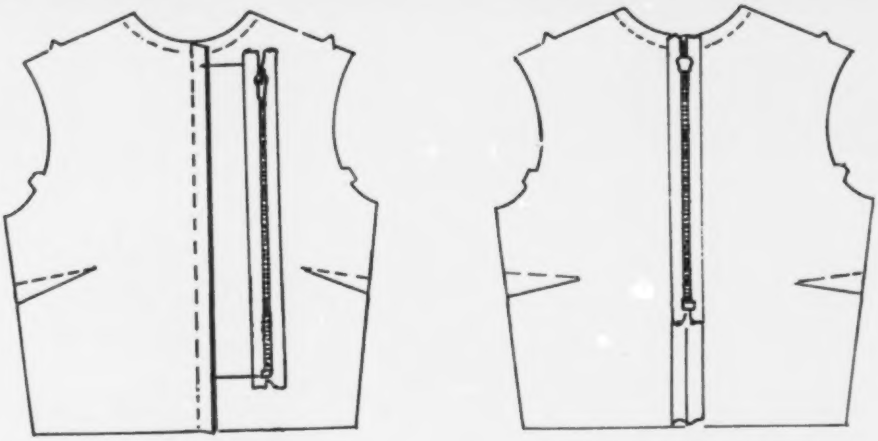
In a ***centered zipper application***, the zipper is centered in a seam and stitched along each side. The zipper is covered with equal amounts of fabric on either side of the opening. The centered zipper application is often used in the center front and center back openings of garments. A centered zipper application can be completed as follows:

- Measure the zipper and mark the length of the opening on the garment.
- Stitch the seam up to the mark for the bottom of the zipper.
- Baste the seam where the zipper opening will be. Press open.
- Place the closed zipper face down on the pressed open seam allowance. Center the zipper coils or teeth on top of the basted seam.
- Baste the zipper in place.
- Turn the garment right side out and press flat. Mark the bottom stop of the zipper with a pin.
- Attach the zipper foot to the sewing machine.
- Position the zipper foot to the left side of the needle and stitch two or three stitches across the bottom of the zipper and pivot and stitch to the top of one side.
- Position the zipper foot to the right side of the needle and stitch the other side of the zipper by stitching two or three stitches across the bottom of the zipper and pivoting and stitching to the top.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and press.

The centered zipper application described is illustrated in figure 12.16.

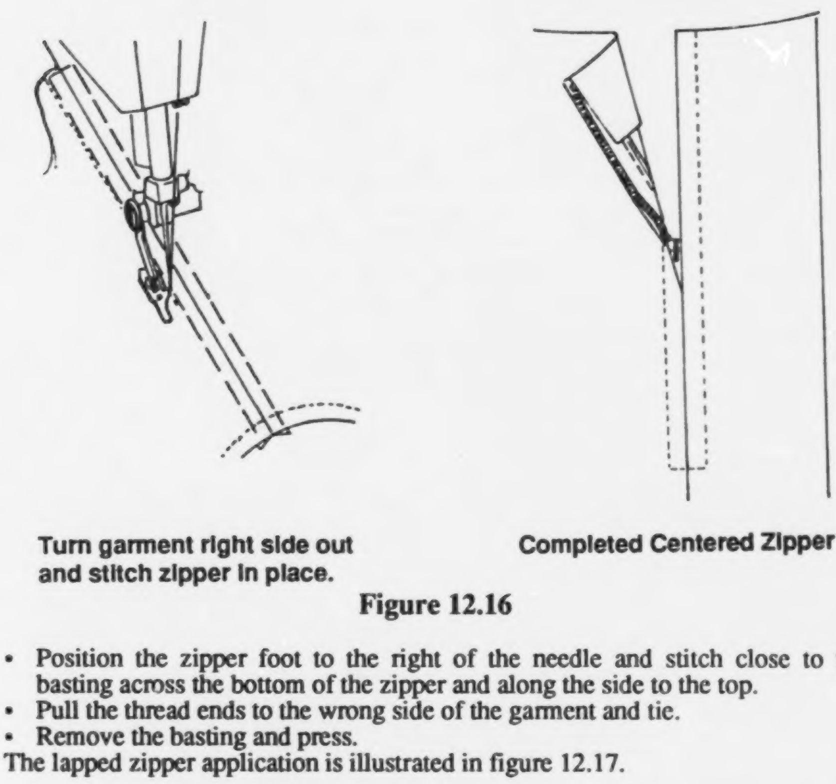
In a ***lapped zipper application***, only one side of the placket covers the zipper. Only one row of stitching shows on the outside of the garment. The lapped zipper application is often used in center front openings, center back openings, and side openings in garments. The following procedure can be used for a lapped zipper application:

- Measure the zipper and mark the length of the opening on the garment.
- Stitch the seam up to the mark for the bottom of the zipper.
- Baste the seam where the zipper opening will be. Press open.
- Extend the right-hand seam allowance. Place the closed zipper face down on the seam allowance. Center the zipper coils or teeth on top of the basted seam and pin.
- Baste the right-hand side of the zipper in place.
- Turn the zipper face up so a fold forms in the seam allowance. Place the fold close to the zipper coils or teeth and pin.
- Attach the zipper foot to the sewing machine.
- Position the zipper foot to the left of the needle and stitch through all thicknesses along the edge of the fold.
- Turn the garment right side out and flatten the fabric.
- Baste across the bottom of the zipper and along the side to the top.



Mark length of zipper on garment opening.

Place zipper on seam allowance.



Turn garment right side out and stitch zipper in place.

Completed Centered Zipper

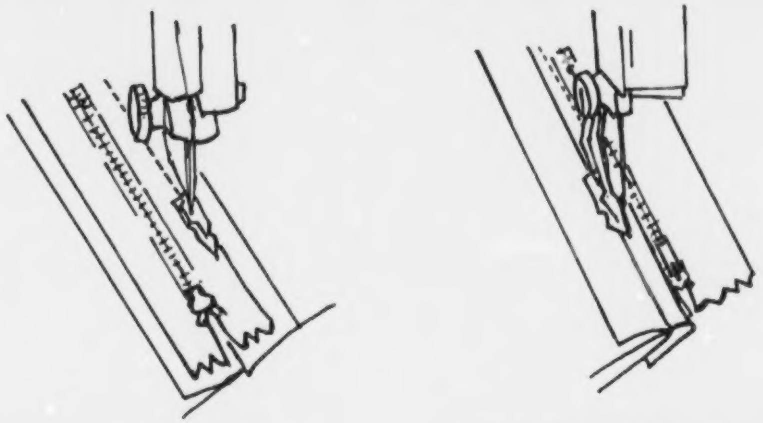
Figure 12.16

- Position the zipper foot to the right of the needle and stitch close to the basting across the bottom of the zipper and along the side to the top.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and press.

The lapped zipper application is illustrated in figure 12.17.

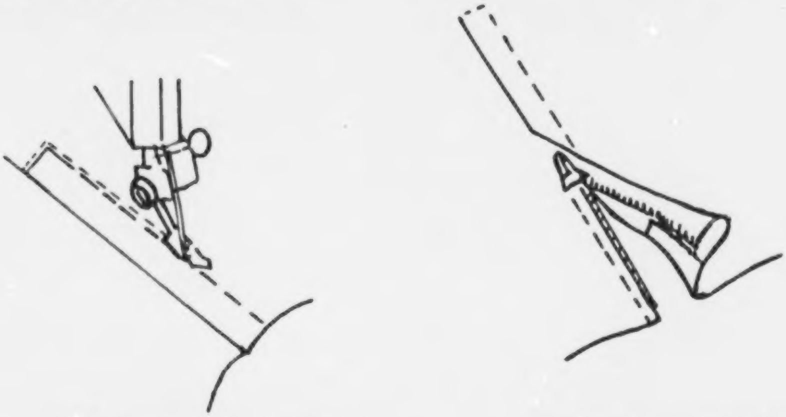
A ***fly-front zipper application*** is similar to the lapped zipper application except that the lap is wider. The fly-front zipper application is commonly used on pants and slacks, shorts, jeans, and skirts. The following procedure can be used for a fly-front zipper application:

- Staystitch the waistline edge of the garment and the bottom of the fly opening. Form a square corner at the marking for the bottom of the fly opening.
- Clip to the stitching in the corner.
- Pin the center front seam with the right sides of the fabric together. Stitch to the marking for the bottom of the fly opening.



Place the closed zipper face down on the seam allowance and baste on the right-hand side.

Turn the zipper face up so a fold forms in the seam allowance and stitch.



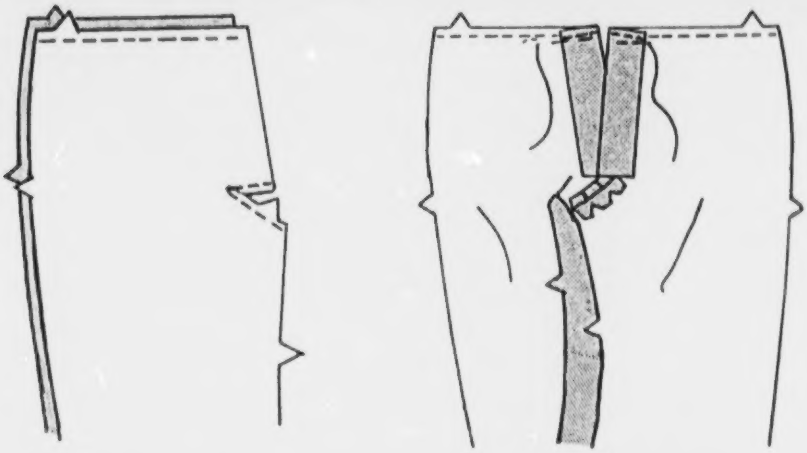
Turn the garment right side out and stitch along the side of the zipper to the top.

Completed Lapped Zipper

Figure 12.17

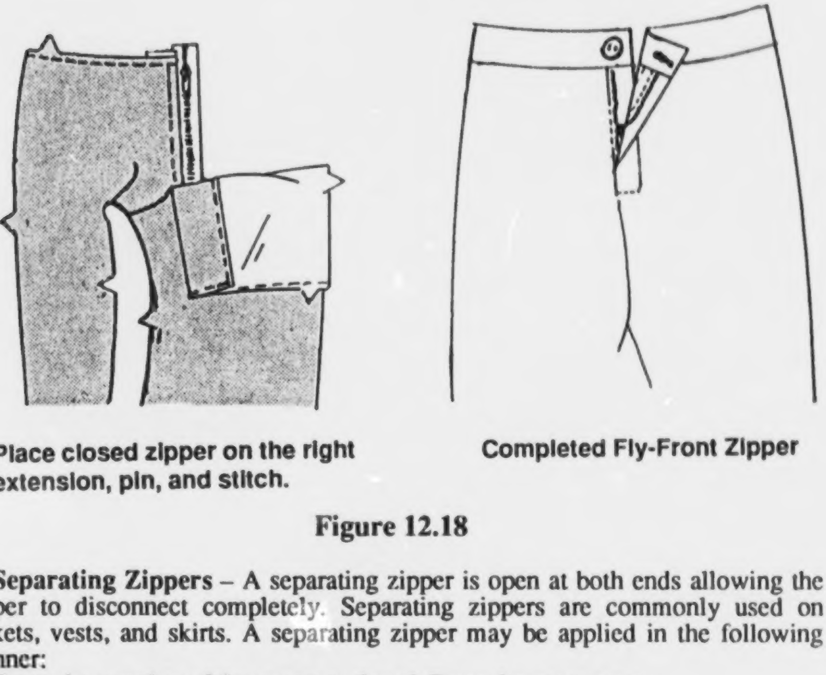
- Clip the curves and press the seam open using a pressing ham.
- Press the left extension to the inside of the garment along the center front line. Baste in place at the top edge of the garment.
- Press the right extension to the inside of the garment along the fold line. Baste in place at the top edge of the garment.
- Place the closed zipper on the right extension with the zipper coils or teeth close to the fold and pin. Make sure the lower end of the zipper is at the bottom of the opening.
- Attach the zipper foot to the sewing machine. Place to the left of the needle.
- Stitch the zipper in place close to the fold.
- Turn the garment to the right side.
- Lap the right front over the left front. Match the center front markings and pin. Baste along the center front line.
- Pin the right front of the garment to the zipper.
- Stitch the zipper to the right front along the stitching line.
- Remove pins and basting.

Figure 12.18 illustrates the fly-front zipper application.



Staystitch waistline edge and bottom of fly opening.

Press left and right extensions to the inside of the garment and baste in place.



Place closed zipper on the right extension, pin, and stitch.

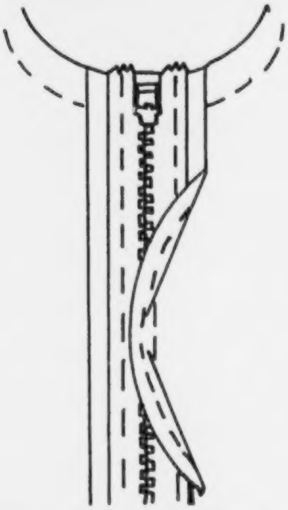
Completed Fly-Front Zipper

Figure 12.18

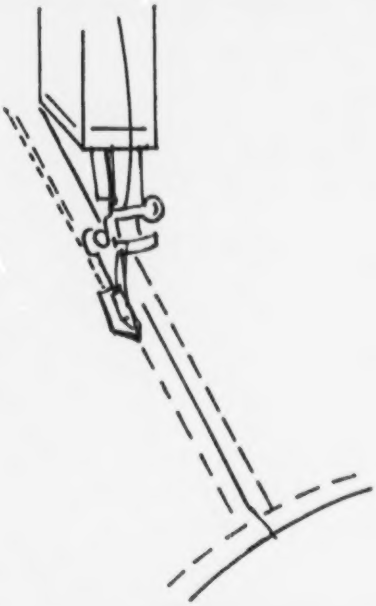
Separating Zippers – A separating zipper is open at both ends allowing the zipper to disconnect completely. Separating zippers are commonly used on jackets, vests, and skirts. A separating zipper may be applied in the following manner:

- Baste the opening of the garment closed. Press the seam open.
- Place the zipper face down on the seam allowances. Center the zipper coils or teeth on top of the basted seam.
- Baste the zipper to the seam allowances.
- Turn the garment right side out and baste the seam allowances and the zipper to the garment 1/4" on either side of the seam line. Do not baste across the bottom of the zipper.
- Topstitch each side of the zipper. Stitch slightly outside the basting.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and open the center seam.

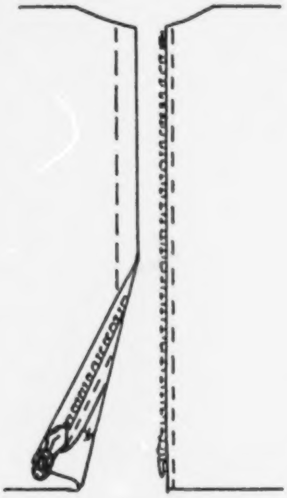
The separating zipper application as described above is illustrated in figure 12.19.



Place zipper face down on seam allowances and baste.



Turn the garment right side out and topstitch each side of the zipper.

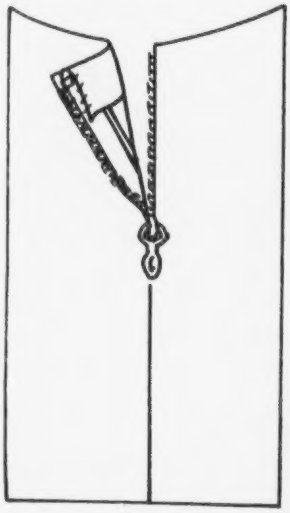


Completed Separating Zipper

Figure 12.19

Invisible Zippers – The invisible zipper differs from both the conventional zipper and the separating zipper. When an invisible zipper is zipped or closed, only a plain seam and pull tab show on the outside of the garment. Invisible zippers are applied to seam allowances so no stitching shows on the outside of the garment.

Manufacturers of invisible zippers include specific instructions for insertion of their brands of zippers. Manufacturers also sell special plastic zipper feet especially designed for inserting their invisible zippers. Since the methods for applying invisible zippers differ, the instructions included with the invisible zipper should be followed.



UNIT CONSTRUCTION

As previously discussed, the unit method of construction involves completing one unit or section of a garment at a time. As units are constructed, they are combined to form new units. Basic garment units for women include skirt front and back, slacks front and back, bodice front and back, and sleeves. Units for men include pants front and back, shirt front and back, and sleeves.

The unit method of construction has many advantages including the following:

- Less time is needed to construct a garment.
- Parts of a garment can be found easily because they are kept together in units.
- Completion of an entire unit occurs before another unit is constructed.
- Fewer trips to the sewing machine and ironing board are necessary.
- Fabric is handled less and maintains its quality.
- Work is completed in an organized manner in which speed and accuracy are emphasized.
- A sense of accomplishment is achieved as the units develop.

The unit method of construction is an efficient way to construct a garment when guidelines such as the following are observed:

- Identify the unit parts on the pattern guide sheet. Mark the units that will be completed first.
- Place all pattern pieces of one unit together so pieces will be easier to locate.
- Press all side darts toward the center unless the fabric is heavy. Cut open and press flat darts on heavy fabric.
- Press all seams before joining them to seams stitched in other directions.
- Baste sleeves in place and check the position and fit.
- Baste waistbands to garments before fitting.
- Hang garments for twenty-four hours before marking hems.

Fitting During Unit Construction

A garment should be fitted during unit construction to ensure that the completed garment will fit properly. Most garments require two fittings. A third fitting may be needed when difficult fabrics or designs are used.

Before the first fitting, specific steps in the construction process should be completed. Before the second and third fittings, construction details previously checked should be stitched, finished, and pressed. In addition, any necessary alterations should be completed. During each fitting, the client should try on the garment wearing the underwear or clothing that will be worn with the garment. Altered areas should be checked for proper fit, and any areas requiring further alteration should be marked. Procedures that should be followed before and during each fitting are included in table 12.2.

Fitting Procedures

Fitting	Before the Fitting	During the Fitting
First Fitting	• Staystitch around the neckline and sleeve openings. • Attach interfacing. • Complete bound buttonholes. • Baste or pin any fullness (such as darts, tucks, pleats, and gathers). • Baste crosswise and lengthwise seams. Permanently stitch where fit is not questioned and other construction lines will not be crossed. • Pin circumference seams. • Pin the collar to the neckline, the sleeves to the bodice, and the skirt to the bodice. • Pin circumference edges. Include all hems.	• Examine the location and fit of darts, pleats, tucks, and gathers. • Check the location, direction, and evenness of lengthwise, crosswise, and diagonal seams. • Determine if the width of the garment is correct. • Check the location of the neck seam line and collar dimensions • Determine if the length of sections of the garment that may affect the width of other sections of the garment is correct. (ex. Lowering the waistline on the bodice might affect the fit of the skirt.) • Check the locations of all circumference seams.
Second Fitting	• Baste circumference seams. Permanently stitch seams that will not create fitting problems. • Leave circumference edges unpinned to allow for marking of hemlines.	• Check circumference seams. Include the neckline and attachment of collar, armholes and fit of sleeves, and smoothness of waistline seam and fit of skirt. • Mark hemlines on garment edges.
Third Fitting	• Stitch hemlines if no fitting problems will occur. • Stitch, finish, and press all seams approved during second fitting. • Construct lengthwise lines that cross circumference seams, such as a placket.	• Examine the appearance of the entire garment. • Study construction details carefully for accuracy. • Check the evenness of the hemlines.

Table 12.2

Points to Remember

- It is important to understand the meaning of pattern symbols and the instructions on the pattern guide sheet to accurately construct garments.
- The pattern guide sheet contains general information about the pattern, a variety of cutting layouts, and sewing directions for constructing the garment.
- In order for a garment to fit properly upon completion and after wearing and laundering, the fabric must be preshrunk and straightened before pattern pieces are cut out.
- The straightness of fabric can be determined by tearing the fabric, cutting along a prominent design line, or pulling a crosswise yarn.
- Before pattern pieces are placed on fabric, the fabric may be folded in a crosswise fold, a lengthwise fold, a partial fold, or a double fold.
- Napped fabrics, plaid fabrics, striped fabrics, and fabrics with geometric designs require special pattern layouts.
- Large pattern pieces marked with place on fold brackets should be pinned to the fabric first followed by pattern pieces marked with grain line markings.
- Construction markings; placement lines for trims, buttons, buttonholes, and pockets; fold lines; and center front and center back lines can be transferred from the pattern to the fabric with a tracing wheel and dressmaker's carbon paper, tailor's chalk, tailor's wax, dressmaker's marking pen, dressmaker's marking pencil, or tailor's tacks.
- Buttonholes are constructed after a garment is completed, and they may be bound, machine-worked, or hand-worked.
- A self-casing or an applied casing can be constructed to hold elastic or a drawstring in place at a waistline, neckline, sleeve, or hemline.
- Collars such as the flat collar, standing collar, shirt collar, and rolled collar are often made of two layers of fabric and one layer of interfacing and then attached to a garment at the neckline.
- A fitted facing or a self-facing may be used to finish a raw garment edge such as an armhole or neckline.
- A garment requiring a hem should hang on a hanger for twenty-four hours and then the hem should be marked, turned up, trimmed, finished, and stitched or fused in place.
- Knitted, woven, or nonwoven interfacing is used to add firmness or help retain the shape of garment edges, collars, cuffs, waistbands, and pockets.
- The lining of a garment may be free-hanging, as in skirts and pants, or it may be attached to the garment hem, as in jackets and sleeves.
- Patch pockets in a variety of shapes, all-in-one seam pockets, and separate seam pockets may be constructed and attached to garments.
- Gathered seams, which retain fullness, and eased seams, which are smooth and unpuckered, are used when sewing together two seam edges of unequal lengths.
- The kimono sleeve is cut in one piece with the garment, the raglan sleeve is attached by a diagonal seam, and the set-in sleeve is attached to the armhole.

- A waistband may be attached in one piece after the zipper is attached, it may be attached in two pieces, and it may be plain or topstitched.
- The centered zipper application, the lapped zipper application, and the fly-front zipper application can each be used to attach conventional zippers.
- In the unit method of construction, one unit or section of a garment, such as a bodice or sleeve, is completed and units are combined.
- During the fitting process, the fit of the garment should be checked at the construction areas, necessary alterations should be marked and completed, and hems should be marked and stitched.

Words to Know

adjustment line
all-in-one seam pocket
alteration line
applied casing
attached lining
band cuff
bias
bound buttonhole
buttoned cuff
buttonhole
buttonhole symbol
casing
center back marking
centered zipper application
center front marking
cutting layout
cutting line
dart symbol
dot
eased seam
facing
fitted facing
flat collar
fly-front zipper application
fold-up cuff
free-hanging lining
fusing
gathered seam
grain line marking
hand-worked buttonhole
hem
hem finish
hemline
lapped zipper application
layout
machine-worked buttonhole
notches
overlap
patch pocket
pattern guide sheet
pattern markings
pattern symbols
placement line
place on fold bracket
plain waistband
pocket
preshrinking
rolled collar
seam line
seam pocket
seam tape finish
self-casing
self-facing
separate seam pocket
sewing directions
shirt collar
sleeve finish
standing collar
stitching line
tailor's tack
topstitched waistband
true bias
underlap
unit
unit method of construction
waistband
worked buttonhole
zipper application

Questions for Review

1. Why is the unit method of construction considered to be an efficient method of constructing garments?
2. Why are patterns marked with pattern symbols?
3. What types of general information are usually included on the pattern guide sheet?
4. Why should fabric be preshrunk and straightened before pattern pieces are cut out?

5. How can the grain of fabric be determined?
6. Why is it important that fabric be on-grain before pattern pieces are cut out?
7. How can off-grain fabric be straightened?
8. Why should the cutting layout on the pattern guide sheet be followed when folding fabric?
9. Why do pattern layouts for special fabrics differ from standard pattern layouts?
10. How should pattern pieces be pinned to the fabric?
11. What guidelines should be observed when cutting out a garment?
12. How do the tracing wheel and dressmaker's carbon paper, tailor's chalk, and tailor's tacks methods of transferring markings differ?
13. How do the construction of bound buttonholes, machine-worked buttonholes, and hand-worked buttonholes differ?
14. What is the difference in a self-casing and an applied casing?
15. How are collars constructed and attached to necklines?
16. In what ways do fitted facings and self-facings differ?
17. What procedure can be followed when turning up and trimming a hem?
18. What methods can be used to attach a hem to a garment?
19. For what purpose is interfacing used?
20. How do the procedures for attaching a free-hanging lining and an attached lining differ?
21. How are patch pockets attached to garments?
22. How do the procedures for constructing an all-in-one seam pocket and a separate seam pocket differ?
23. What is the difference in a gathered seam and an eased seam?
24. How do the construction of kimono, raglan, and set-in sleeves differ?
25. In what ways do the procedures for constructing a plain waistband and a topstitched waistband compare?
26. How do the centered zipper application, lapped zipper application, and fly-front zipper application relate?
27. How can a separating zipper be applied to a garment?
28. Why is an invisible zipper said to be invisible?
29. What are some advantages of unit construction?
30. Why should a garment be fitted on the client during unit construction?

13

Garment Alterations: Fitting

ESSENTIAL ELEMENT

- Describe considerations for fitting garments.(q5A and q9A)

OBJECTIVES TO ACHIEVE

- Identify the characteristics of good fit in garments for women and men.
- Determine common fitting problems for women's garments including problems with length of garments.
- Describe common fitting problems for men's garments including problems with length of garments.
- Compare basic techniques used to mark garments when fitting.

Alterations are used to change a garment so that it fits well and is more comfortable and attractive. A good fitting garment enhances a person's image. The most perfectly constructed garment will fail to complement the wearer if it does not fit well. Ready-to-wear is sold in a wide range of sizes; however, individual figures within each size range vary. As a result, a variety of fitting problems exist. This chapter identifies problems often encountered in fitting garments. Chapter Fourteen provides more detailed information on how to correct the identified problems.

GARMENT FIT

A well-constructed garment should lie smoothly over the body curves with side seams perpendicular to the floor. As discussed in Chapter Fourteen, it should have sufficient ease to permit freedom of movement and to provide comfort when sitting, stooping, walking, and reaching. The characteristics of good fit in garments, for both men and women, include the following:

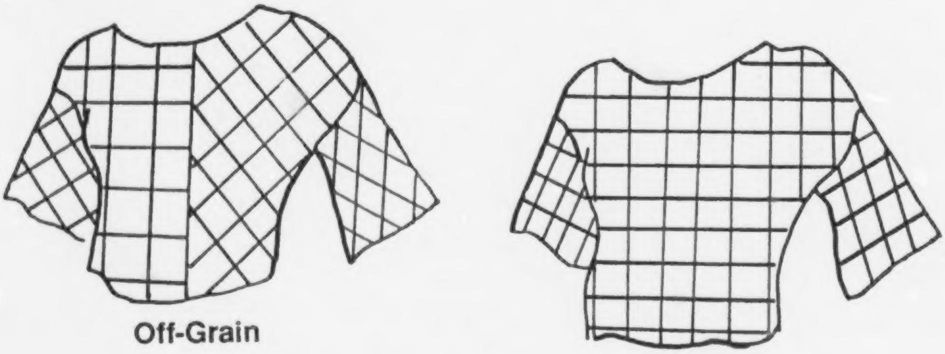
- neckline – There should be no gapping or wrinkling; the garment should fit close to the body.
- shoulder – The garment should lie straight from the neck to the shoulder. It should not pull to the back or the front.
- armhole – The armhole should be cut full enough for normal movement, about 1/2" to 1" below the armpit.

- buttonhole – The buttonhole should hold the button firmly in place without straining.
- bust and waistline darts – A bust dart should point to but not extend through the fullest part of the bust. Darts should taper to a point without pulling or wrinkling.
- waistline – The waistline should fall naturally on the waist without riding up or sliding down.
- sleeve length – Long sleeves should touch the hand where the hand joins the wrist; sleeve length should be comfortable and appropriate for the garment with elbow darts falling at the bend of the elbow.
- hip line – Darts should shape the fullness of the garment so that it lies smoothly without wrinkles or tucks.
- side seam – Each side seam should hang straight from the armhole and waistline and be perpendicular to the floor without straining or pulling.
- garment length – The length of the garment should be in proportion to the whole garment and the individual's figure; hems should be flat and smooth with no puckers or gathers.
- grain line – The crosswise and lengthwise grain lines should be perfectly straight and at right angles to each other.

Grain Line

Grain lines must be straight in order to achieve good fit in a garment. The ***grain line*** refers to the directions the yarns are woven into the fabric. The lengthwise grain line consists of the stronger yarns, and the crosswise grain line consists of the weaker yarns. As a result, it is much easier to tear fabric crosswise than lengthwise. Additional information on grain may be found in Chapters Six, Seven, and Twelve.

If the grain line is not straight, a garment will tend to hang unevenly and pull to one side. This flaw in a garment may not be immediately visible unless the fabric is checked, striped, or plaid. With these fabric designs, it is easier to see off-grain fabric hanging crooked or uneven. When a garment is constructed of off-grain fabric, it is almost impossible to alter it to achieve a good fit. It is possible to become more skilled at detecting garments that are made with off-grain fabric. Having this ability is useful when buying and altering garments. Figure 13.1 shows two bodices constructed from checked fabric. One bodice was cut and sewn with the fabric on-grain; the other bodice was constructed with off-grain fabric.



Off-Grain

On-Grain

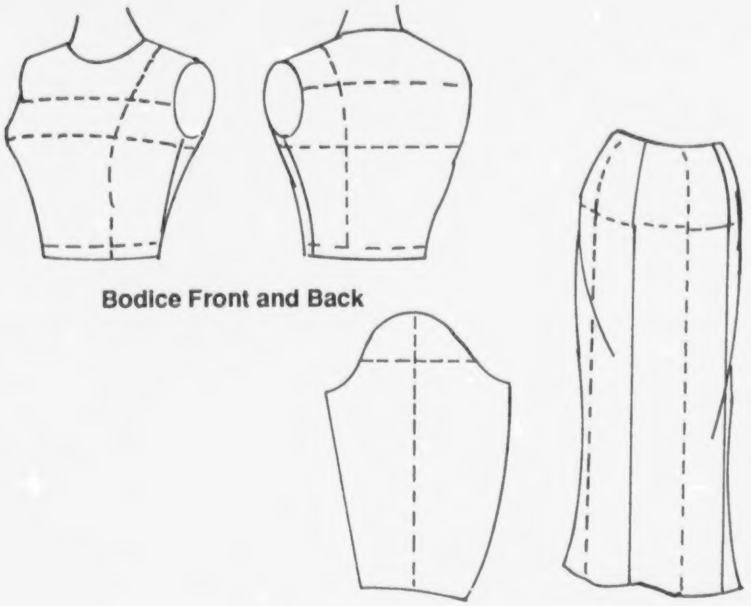
Figure 13.1

Bias

As discussed in Chapter Twelve, a garment that is cut diagonally across the fabric is cut on the bias. This effect creates a unique look, giving more stretch and ease to the garment. When a garment is cut at an exact 45° angle to the selvage, it is considered to be on the true bias. It is important to use the true bias rather than just any diagonally cut piece of fabric if an item is to be cut on the bias. To find the true bias, fold one corner of the selvage diagonally across the fabric to form a triangle as shown in the illustration on page 214 of Chapter Twelve.

Checking for Fit

Checking a garment for fit can be done easily if a person is familiar with the characteristics of good fit. The client should try on the garment wearing appropriate shoes and undergarments and should stand in front of a full-length mirror. It is best if the client stands erectly but not abnormally rigid. To check for fit, one must study the garment looking for pulls or strains which may be causing wrinkles. These wrinkles may be caused by inaccurate grain lines or a tight or loose fit. To alleviate the wrinkles, changes in horizontal and/or vertical seams may be required. Figure 13.2 shows the grain lines that must be straight so that no wrinkling occurs.



Bodice Front and Back

Sleeve

Skirt Front or Back

Figure 13.2

Fittings to Avoid

An alterationist is limited in what he or she can do to change a garment and please a client. It is always best if a client purchases a garment that is as close to the correct size as possible. Most alterations are too costly and extensive if altering more than one size smaller or larger than the original garment size. Only a limited number of changes can be made to some garments without losing the shapes of the garments. When alterations appear to be very extensive, it is probably best to recommend that the client purchase a different garment in the correct size.

Garments made of some fabrics cannot be altered successfully because they show permanently set-in creases, needle marks, or obvious discoloration. The following are examples of fabric types that are difficult to alter:

- corduroy
- fabrics with permanent press finishes
- leather
- satin or fabrics with moiré finishes
- sequin or bead trimmed fabric
- suede cloth
- velvet
- vinyl

It is important that a soiled garment be laundered or dry-cleaned before it is altered. Pressing required during the alteration process may permanently set soil or stains into fabric. This results in the garment being difficult or impossible to clean.

MEASURING FOR GARMENT FIT

Knowing a client's body measurements is not always necessary when altering a garment, but it can be helpful. If a client requires frequent, extensive alterations, keeping a personal measurement chart for the client is suggested. Body measurements for ready-made garments may be taken over lightweight, closefitting clothing. The correct amount of ease should be added to these body measurements so the garment fits well. Information in Chapter Ten should be reviewed before taking a client's body measurements.

When altering ready-made garments, the basic measurements needed for the female figure are the bust, waist, and hips. Skirt length, back bodice length, and sleeve length may be needed for certain alterations. Different measurements are needed for altering male clients' garments than those required for female clients' garments. The basic measurements needed for the male figure are the chest, neck, waist, inseam, and sleeve length. The measurements needed depend on the garment to be altered and the alterations required.

Children's body measurements should be checked frequently due to rapid growth. The stage of physical development that a child is entering will also affect body measurements. The same basic measurements used when altering adult clients' clothing can be adapted for use in altering children's clothing.

FITTING PROBLEMS FOR WOMEN'S GARMENTS

There are many different clothing styles, apparel manufacturers, and garment sizes to suit the needs of women with various figure types. Some women feel most comfortable wearing slacks and lead a lifestyle that allows them to wear slacks. Other women prefer to wear only one-piece dresses to reflect femininity. Other women want to appear as business-like and professional as possible, choosing tailored suits as the primary components of their wardrobes. Having a wide range of choices gives women the freedom to be comfortable while they can also express individualism.

The majority of women's alterations involve the lengthening or shortening of garments; however, sometimes more complex alterations are necessary. Selected examples of these more complex fit problems are discussed in the remainder of this section.

Dresses

The many styles of dresses from which to select in the ready-to-wear market can help alleviate some fitting problems. Dresses that are designed with a dropped waistline, dolman sleeves, or a blouson bodice are examples of garments that tend to require few alterations. However, alterations may still be required on some parts of the garments. A dress normally consists of a bodice and skirt, both of which can be altered in many ways. Most of the alteration procedures used on a dress bodice are similar to procedures used when altering a blouse. The same principle applies to skirts; alterations made to the skirt of a dress would be similar to those made to a skirt. Skirt and blouse alteration procedures are discussed later in this chapter. Some of the following problems may be identified when fitting a dress:

- waistline too long or short
- waistline too tight or loose
- hip line (in a dress without a waistline) too tight
- excess gathered fullness (in a dress with a waistline seam)

Blouses

There are several areas of a blouse or bodice that can be altered to achieve an adequate fit. The shoulder, neckline, and bust areas are the most difficult areas to alter in most garments. Therefore, when purchasing a garment, it is important to select a garment that fits as well as possible in these particular areas. The basic principles that follow can be used to alter various types of bodices, such as the bodice of a dress, blouse, jacket, coat, or evening gown.

Neckline – The neckline is one of the first parts of a garment people notice because it is close to the face. There tends to be emphasis on decoration at the neckline; therefore, it is very important that the neckline fits perfectly. Some of the following fit problems can occur at the neckline:

- back neckline fullness or tightness
- front neckline fullness or tightness
- entire neckline too large or too small
- neckline too high
- collar and neckline too small or too large

Shoulders – The shoulder area also helps frame the face and should fit the body as closely as possible. Fitting problems such as a garment that hangs unevenly may result from improper fit in the shoulder area. Some of the following fitting problems may occur in the shoulder area of a garment:

- shoulder of the bodice too wide
- shoulder of the bodice too narrow
- shoulder seam of the bodice too high
- sloping shoulders on the body
- protruding shoulders on the body

Bodice – The ***bodice*** is the section of a woman's garment that covers the body from the neck to the waistline. The bodice includes the darts and fullness that give the garment its overall silhouette and shape. Even loose-fitting garments usually have some shape to the bodice created by construction details such as gathers, pleats, or tucks. The following fit problems may occur when fitting a bodice:

- bodice too loose in the front and/or back
- bodice too tight in the front and/or back
- bodice too long in the front and/or back
- bodice too short in the front and/or back
- underarm bust dart too high or too low
- underarm bust dart too short
- underarm bust dart too long and/or too deep
- armhole bust dart too long
- armhole bust dart too short and/or shallow
- waistline dart too long in the front and/or back
- waistline dart too short in the front and/or back
- waistline dart too tight in the front and/or back
- waistline dart too loose in the front and/or back

Sleeves – The problems resulting from poor-fitting sleeves can be frustrating to correct. It is best to examine the garment's proportions and lines after other alterations are complete to determine the best width and length for a sleeve. Some of the following fit problems can occur in sleeves:

- too tight
- too loose
- too full at the top of the sleeve cap
- too tight at the armhole
- set-in sleeves are off-grain

Skirts

Skirt alterations are usually easy alterations to make. Skirts have few curves to fit, and they hang from the waist or hips with straight seam lines. Consequently, it is important to make sure a garment fits best in the shoulder area and neckline rather than the skirt when purchasing a garment. Some of the following fit problems can occur in skirts:

- too small in the waistline
- too large in the waistline
- too large in the upper hip and/or lower hip area(s)
- too small in the upper hip and/or lower hip area(s)
- too full in the upper back
- too tight in the upper back
- too full across the abdomen
- too tight across the abdomen

Slacks

Slacks are an important fashion concept for women. Slacks can be worn for many occasions and in some work settings. With the increased demand for slacks in the daily wardrobe, it is necessary to know the appropriate fit for slacks on the female figure. Some of the following fit problems can occur in slacks:

- waistline too loose
- waistline too tight
- too high-waisted in the back and/or front
- too tight in upper and/or lower hip line
- too large through the hips
- too large in the seat seam

- too tight through the crotch
- too baggy through the crotch
- too large in the front and/or back
- too wide or narrow through the leg

Figure 13.3 illustrates the important points to check when fitting women's slacks.

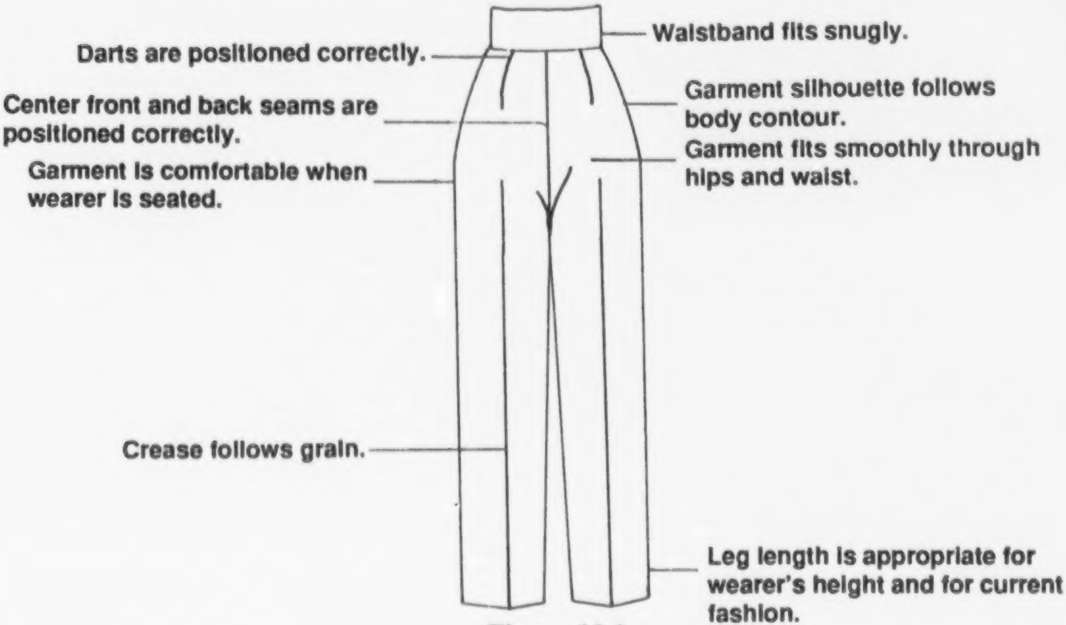

Waistband fits snugly.
Darts are positioned correctly.
Center front and back seams are positioned correctly.
Garment silhouette follows body contour.
Garment fits smoothly through hips and waist.
Garment is comfortable when wearer is seated.
Crease follows grain.
Leg length is appropriate for wearer's height and for current fashion.

Figure 13.3

FITTING PROBLEMS FOR MEN'S GARMENTS

In the past, altering men's clothing has been a more common occurrence than altering women's clothing. Men find it more difficult to buy ready-to-wear clothing that fits perfectly than women. The shape of the male body and the way clothing hangs on the male body make most alterations easier to accomplish than alterations on a woman's garment. When a man purchases a suit, there are few if any alteration charges. The price of the suit usually covers the cost of most alterations. Women's alterations, on the other hand, are seldom free of charge. Some retail stores are changing their policies regarding women's alterations to make policies the same for female customers as they are for male customers.

Men have fewer wardrobe alternatives than women, but men still have the opportunity to develop their own senses of style. It is just as important for a man to feel self-confident and comfortable in his clothing as it is for a woman. In the past, men who viewed their clothes and appearance as important were considered by some to be pretentious and arrogant. These attitudes are changing, and society is now much more accepting of men being concerned with their appearances and overall images.

Some men may need assistance from a salesperson, alterationist, or a companion to correctly assess how certain garments look and fit their particular figures. When selecting garments for men, it is important to check color, fabric, texture, silhouette, and fit to ensure the best purchase possible.

Fit is a primary concern in selecting a man's garment because only a limited amount of change can be made to garments without losing the shape and the original design. Like women's fashions, the majority of men's alterations involve the lengthening or shortening of a garment, but additional changes can usually be made by a professional tailor or alterationist. Some examples of fit problems of men's garments are discussed in the following sections.

Jackets

Jackets, whether suit jackets or sports jackets, are an important part of many men's wardrobes. The fit of a jacket is determined by the size of a man's shoulders. The jacket length required for a particular client is determined by the man's height. Although some men may prefer a loose or close fit in their clothing, there are certain areas that must fit correctly so the jacket looks good when worn on the body. Some of the following fit problems may occur when fitting jackets on men:

- gathers under the collar
- too wide across the shoulders
- too narrow across the shoulders
- gathers under the arm
- fullness between the lapel and the shoulders
- pulling across the abdomen
- fullness around the abdomen
- pulling across the back
- sleeve wrinkles in the front and/or back
- collar stands away from the back of the neck

Pants

Men's pants are sized by the waist measurement and the inseam measurement. The inseam is measured from the crotch to the hem, following the inside seam of the pants. Some men may prefer more or less ease in the way their pants fit, but there are some basic areas that must fit correctly for the pants to look good on the body. Some of the following fit problems can occur in pants:

- waistline too loose
- waistline too tight
- too tight through the crotch
- too baggy through the crotch
- too wide or narrow through the leg

Shirts

Dress shirts are meant to be worn with a tie and are sized according to the circumference of the neck and the length of the sleeve. Causal shirts such as knit shirts, flannel shirts, and some sport shirts are sized according to the overall size of the man such as small, medium, large, and extra-large. The ready-to-wear industry has standardized the sizing of most men's garments so they are more uniform in size than women's garments. Once men know their measurements and know what style of shirt fits them best, they are able to safely buy shirts made by different manufacturers without trying them on. The following fitting problems may need correcting for a dress shirt to fit properly:

- sleeves too long or too short
- long sleeve shirt changed to a short sleeve shirt
- shirt too large and billowy through the body
- collar is worn or needs updating

LENGTHENING AND SHORTENING GARMENTS

One of the most noticeable parts of a garment is the hem and where it falls on the body. The hem is a part of the garment that is turned under and stitched down. Hems are placed at the lower edges of skirts, slacks or pants, dresses, jackets, coats, and sleeves. The length of a garment is a very important aspect of the garment's overall look.

Altering the length of a garment is the most common of all alterations and is relatively easy for someone who has practiced on different types of garments. It is also the last alteration made to a garment. Additional information on hems is included in Chapters Twelve and Fourteen. Some problems that may arise when altering the length of a garment are as follows:

- lengthening or shortening an uneven hemline
- lengthening or shortening a garment with trim, pleats, or ruffles
- lengthening or shortening a lined garment
- lengthening a narrow hem
- lengthening or shortening garments made of unusual materials such as leather, fake fur, vinyl, and manufactured suede
- shortening floor-length garments

MARKING GARMENTS FOR ALTERATION

Once fitting problems have been identified, the alterationist or fitter must mark the garment before alterations can be made. There are many different ways to mark a garment. Some methods are more commonly used when marking women's garments than men's garments, and some are more appropriate when marking certain parts of a garment.

Pin fitting is a marking method used to determine where and how much fabric should be taken in by placing straight pins in the fabric. Pin fitting is more effective in garments that are too large or loose than in garments that are too small or tight. Gathering the excess fabric and pinning it together as close to the body as necessary will help the alterationist identify the changes needed. Pin fitting can be an accurate, quick way to mark garments for necessary alterations. When fitting with pins, it is safest to place the pins with the points directed away from the body or toward the hemline to avoid sticking the client.

Pin fitting is a good method to use for alterations that can be done in one fitting. A disadvantage of pin fitting is that pins slip out of fabric easily if handled a great deal. If pins do slip out and the fitting line is lost, refitting the garment on the client may be necessary. This can be a time consuming, irritating problem for the client and the alterationist.

The adjustments marked by temporary pin fitting can be transferred to the garment so that the markings are semipermanent and more reliable. These professional techniques include the use of thread, chalk, wax, or clip markings. Using a lead pencil or ballpoint pen is not a professional method of marking and should be avoided.

Thread markings are long basting stitches that can be made to replace temporary pin markings. Thread markings hold the altered garment more securely and will stay in place until the alteration is completed. For this reason, using thread markings is the safest method of replacing pin markings. For many fabrics such as lace, chiffon, organdy, and white or light colored fabric, thread is the most appropriate method of marking. It is best to avoid marking with dark colored threads; these colors tend to bleed and may permanently stain the fabric. Special basting thread is available that breaks easily and is easier to remove than regular sewing thread.

Tailor's chalk is a clay based, chalk material that is used to mark fabrics. Tailor's chalk can be brushed off and tends to disappear quickly if a garment is handled a great deal. Therefore, it is best to use tailor's chalk on the wrong side of a garment. Although tailor's chalk is available in a variety of colors, it is best to use white or light colored chalk so no trace of the markings can be seen on the finished garment. ***Tailor's wax*** is a marking material made from white or colored wax in the shape of a square. It is especially popular when marking men's clothing because it can be used on the outside of a garment. Tailor's wax can be used on wool only. It melts and disappears when pressed. It may be necessary to test various types of tailor's chalk and wax on different fabrics to see which marking method is easiest to remove.

Marking a garment with small scissor cuts in the seam allowance is referred to as ***clip marking***. The primary benefit to clip marking is to aid in realigning the grain line when a large amount of the garment has been ripped apart. Scissor clips should be small, only 1/4" deep into the seam allowance, and should be made with care. If clips are made much deeper, they may perforate the seam and damage the garment. Once clips are placed in the seam allowance, the possibility of using the seam allowance for any further adjustments may be eliminated.

An easy method for marking skirt and dress hemlines is to use a skirt marker or hem marker. The hem marker is a ruler attached to a weighted base. The hem marker marks a skirt or dress hem while the garment is on a dress form or human body. Some hem markers have an adjustable device that releases powdered chalk to mark hems by use of an attached pressure bulb and hose. Other hem markers have an adjustable clamp for inserting pins or marking hems with chalk. Pin fittings would not be necessary in most cases where a hem marker is used.

Another marking tool that can replace pin fittings is the automatic hem gauge or sleeve gauge. This tool is a 3"-by-5 1/2" gauge used to turn garment hems, sleeve hems, and edges of pockets. This gauge is placed on the fabric, the fabric is turned up the desired amount, and the item is pressed without the use of pins.

Points to Remember

- The most perfectly constructed garment will fail to complement the wearer if it does not fit well.
- A well-constructed garment should lie smoothly over the body curves, have side seams that are perpendicular to the floor, and have sufficient ease to permit freedom of movement and comfort.
- When a garment fits properly, the grain line is perfectly straight in both the lengthwise and crosswise directions.
- Cutting a garment diagonally across the fabric is called cutting on the bias. Bias-cut garments have a unique look and more stretch and ease that garments cut on the lengthwise grain.
- When checking for fit, the client should wear the garment with appropriate shoes and undergarments and should stand erectly in front of a full-length mirror.
- Fittings to avoid include those involving garments to be altered more than one size smaller or larger, garments made of fabrics that are difficult to alter, and garments that are soiled.
- When altering ready-made garments, the bust, waist, and hip measurements are needed for female clients. The chest, neck, waist, inseam, and sleeve length measurements are needed for male clients.
- Men's clothing is usually not as difficult to alter than women's clothing because of the shape of the male body and the way clothing hangs on the male body.
- The hem is a part of the garment that is turned under and stitched down. Altering the length of a garment is the most common of all alterations and is relatively easy to accomplish.
- Pin fitting is a temporary marking method used to determine how much fabric should be taken in by placing straight pins in the fabric.
- Pin fittings can be transferred to garments in a variety of ways including the use of thread, tailor's chalk, tailor's wax, and clip marking.

Words to Know

bodice
clip marking
grain line
pin fitting
tailor's chalk
tailor's wax
thread markings

Questions for Review

1. What are five characteristics of good fit in garments? Why do these characteristics indicate good fit?
2. Why is it important for a garment to be constructed from fabric that is on-grain?
3. How is the true bias found in a piece of fabric?

4. Why should garments made of certain types of materials such as velvet or leather not be altered?

5. What are the basic measurements needed when altering a garment for a female client?

6. What are the basic measurements needed when altering a garment for a male client?

7. How are the alterations made on a dress related to alterations made on other garments?

8. What are the four areas of a blouse that might require alterations? Why?

9. When purchasing a garment that does not fit properly, why is it important that the upper portion of the garment fit best?

10. What is the most common fitting problem for men's and women's garments?

11. How are pin markings transferred to garments?

12. What are two types of marking tools that eliminate pin fittings? How are these tools used?

14

Garment Alterations: Adjustments

ESSENTIAL ELEMENT

- Demonstrate garment adjustments following alteration markings.(q5B and q9B)

OBJECTIVES TO ACHIEVE

- Interpret alteration tags and symbols used to mark garments.
- Analyze procedures for altering waistlines and hip lines of dresses.
- Demonstrate procedures for altering necklines and shoulders of blouses and shirts.
- Apply techniques for altering bodices and sleeves.
- Identify procedures for altering the waistlines and hip lines of skirts.
- Apply alteration procedures to adjust the fit of pants and slacks.
- Interpret the alteration procedures for jackets.
- Demonstrate the process of lengthening and shortening garments.
- Summarize general procedures for altering children's garments.

As discussed in Chapter Thirteen, there are many types of fitting problems. This chapter addresses the most common fitting problems and identifies specific procedures for marking and sewing. In addition, general information is provided regarding alteration procedures. Although an alterationist may encounter other problems, with practice and forethought, the procedures in this chapter may be adapted and applied to most alteration tasks.

The skills of good alterationists are in demand in today's service-oriented society. Alterationists may be employed in retail stores, commercial dry cleaners, commercial laundries, or businesses that perform custom sewing and altering. The demands for skilled alterationists are increasing due to the increased number of men and women in the work force. As discussed in Chapter Thirteen, many stores are now extending their free alteration services to women and men. Increased sales of apparel are likely to result in more people needing alteration services.

Organization is the key to being an effective alterationist. It is important to plan ahead so that work is enjoyable and effective. Several time management principles can be incorporated into an individual's work plan to increase efficiency and quality of work. Implementing time management principles may improve job satisfaction and employee loyalty. The principles of motion economy, discussed in Chapter Nine, can be helpful to employees who work in the area of alterations.

Time and energy savers that may be helpful to an alteration employee include the following:

- Organize all supplies in a sensible, neatly arranged manner.
- Keep all machines and tools in good working order with extra parts available in case of an emergency.
- Keep the work area clean, comfortable, and well-stocked.
- Make sure the work area is well-lighted.
- Complete all of one particular task such as clipping, pressing, ripping, or marking before moving to another task.

Like many skills, practicing the techniques involved in altering clothes helps a person become more skilled and capable of working faster. As experience is gained, the process becomes easier.

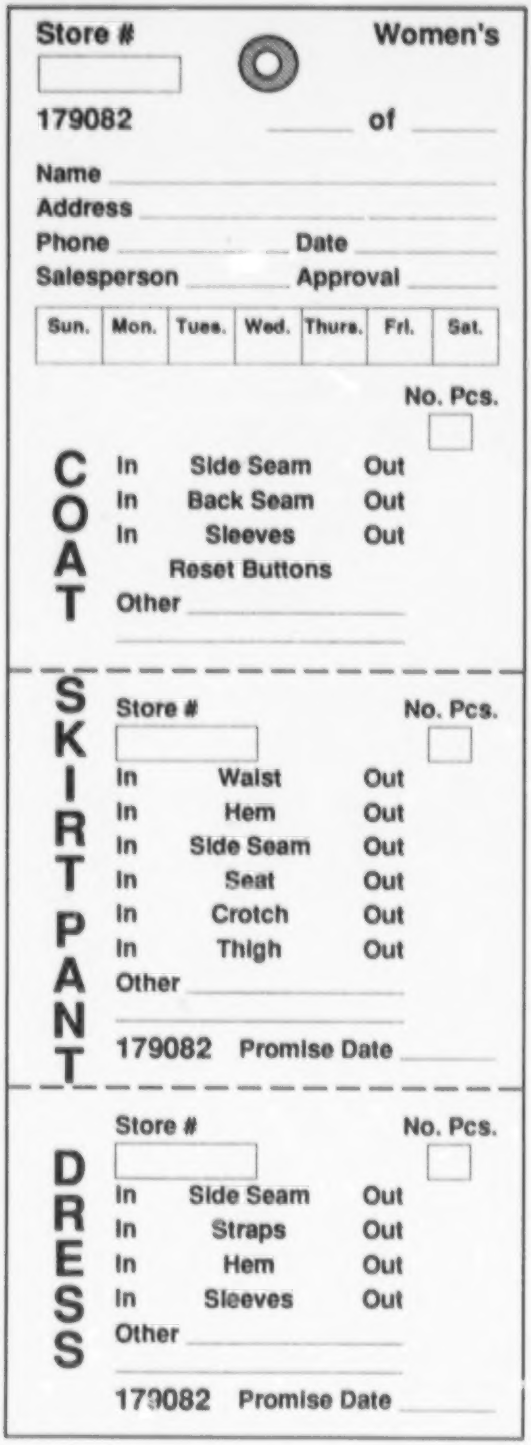
ALTERATION TAGS AND MARKINGS

Specialty stores and department stores that have alteration departments may have salespeople trained to fit and mark garments for customers. A person who is trained to view garments on a client, make fitting suggestions, determine what changes are possible, and actually mark the garment is called a ***fitter***. The fitter may also be one of the people responsible for completing the alteration tag. This tag travels with the garment from the sales floor to the alterations department.

For more difficult alterations and for many women's alterations, the alterationist is asked to fit the garment in the department. This procedure is time consuming but often alleviates the chance of error and poor communication between the fitter and the alterationist. Letting the customer discuss his or her fit problems directly with the alterationist may give the customer more confidence that the garment will be altered to his or her satisfaction.

The ***alteration tag*** is a tag used to record alteration instructions. It is attached to the garment to be altered and is the primary source of communication between the fitter and the alterationist. The alteration tag contains all of the information necessary to alter the garment and return it to the client. If the alteration tag is completed incorrectly, the alteration will probably be completed incorrectly. For this reason, it is very important to check the alteration tag against the markings on the garment to make sure they correspond. If the alterationist has any doubt or questions about the information on the tag, additional communication with the fitter or the client may be necessary.

The alteration tag may be completed by the fitter, salesperson, or alterationist. It includes vital information about the client such as name, phone number, and address. It should also have a description of the alteration(s) needed, the salesperson's name or identification number, the date of the fitting, and the date the garment will be ready. Other helpful information that might be included is any necessary body measurements, the number of garment pieces being altered for the client, and the store number if the garment is sent to another location where alterations are made. Most alteration tags have a perforated edge with a corresponding code number on both pieces of the tag. One portion is torn off and given to the client; the other portion is attached securely to the garment. The client uses the tag to claim his or her garment. Two examples of alteration tags are illustrated in figure 14.1.



Store # ☐ **Women's**

179082 ____ **of** ____

Name ____
Address ____
Phone ____ **Date** ____
Salesperson ____ **Approval** ____

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

No. Pcs. ☐

COAT

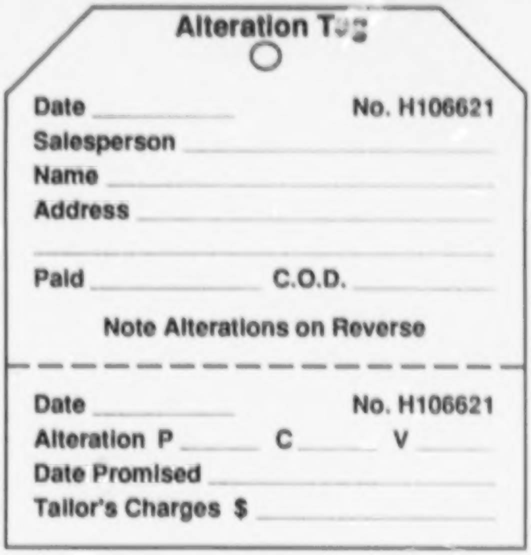
In Side Seam Out
In Back Seam Out
In Sleeves Out
Reset Buttons
Other ____

SKIRT PANT

Store # ☐ **No. Pcs.** ☐
In Waist Out
In Hem Out
In Side Seam Out
In Seat Out
In Crotch Out
In Thigh Out
Other ____
179082 **Promise Date** ____

DRESS

Store # ☐ **No. Pcs.** ☐
In Side Seam Out
In Straps Out
In Hem Out
In Sleeves Out
Other ____
179082 **Promise Date** ____

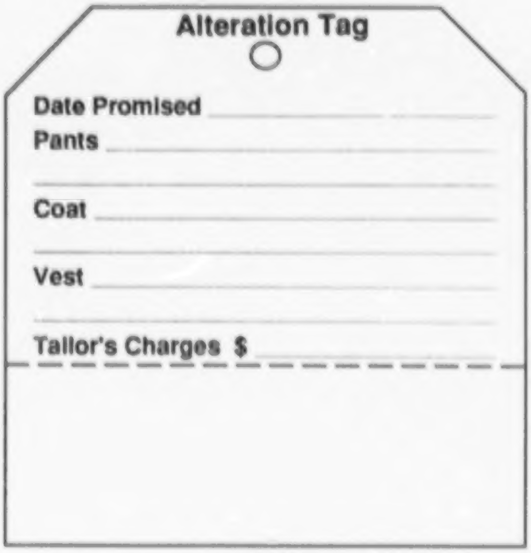


Alteration Tag

Date ____ **No. H106621**
Salesperson ____
Name ____
Address ____
Paid ____ **C.O.D.** ____
Note Alterations on Reverse

Date ____ **No. H106621**
Alteration P ____ **C** ____ **V** ____
Date Promised ____
Tailor's Charges $ ____

Front



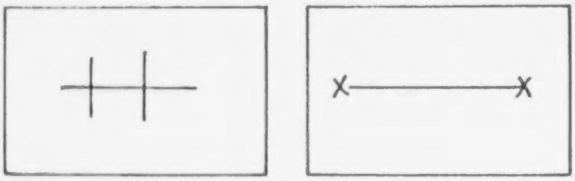
Alteration Tag

Date Promised ____
Pants ____
Coat ____
Vest ____
Tailor's Charges $ ____

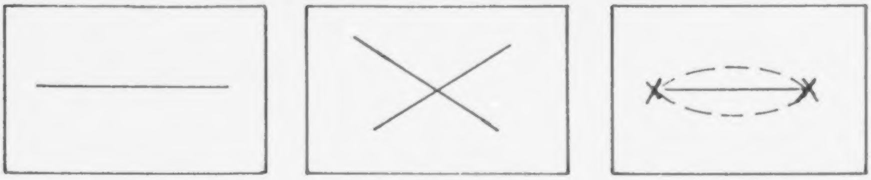
Back

Figure 14.1

There are some standard symbols used in marking garments for alterations. These symbols may be used on alteration tags, so it is important to understand what they represent. The symbols described in figure 14.2 are marked on garments with tailor's chalk or tailor's wax. Some of these symbols may be adapted by individual fitters and alterationists. The fitter and alterationist who work for a particular business must communicate clearly and be aware of any personal adaptations of the standard symbols so that alterations are done as requested by each customer or client.



Lengthen **Release Space**



Shorten **Alter Only One Side** **Take In Space Between**

Figure 14.2

GENERAL ALTERATION PROCEDURES

The large number of alterations that can be performed on any one type of garment prevent detailed explanations of each possible alteration. Some of the most common and adaptable alteration solutions are described in this chapter. One section of this chapter is devoted to lengthening and shortening garments; therefore, lengthening and shortening is not included with alteration procedures for each garment type.

It requires more time to alter a garment that is lined than one that is unlined. Most of the procedures used to alter the garment are also used to alter the lining. If the lining is not altered properly, the garment will fit poorly and the lining may hang below the edges of the garment.

Altering a garment with a facing usually requires a minimum amount of change, such as trimming or clipping. Some garment alterations require that a new facing be cut to replace a facing that no longer fits the garment. When making alterations to a garment, the lining and/or facing must be separated from the garment so the necessary alterations can be performed. Once these alterations have been completed, all altered facings and linings should be reattached to the garment.

Some of the following guidelines will help make altering ready-to-wear garments an enjoyable, productive task:

- Do not sacrifice quality for speed. Most clients usually prefer to wait for an accurate, professional alteration than to rush the alterationist into doing a less than perfect job.
- Avoid underestimating the time required for completing an alteration when promising a garment to a client; it is usually better to overestimate than to

underestimate the expected time needed to do the work. It is important that the garment is ready when the client arrives to pick it up.

- Double-check the instructions on the alteration tag. Make sure the instructions correspond to the markings on the garment.
- Call the client if questions arise about the alterations to be performed after the client has left the store.
- Consider construction design, fabric finish, type of fabric, seam widths, and the age of the garment before making a decision that requires a garment alteration.
- Keep the seam allowance as wide as possible for future alterations that may require letting out a seam.
- Examine the way in which a garment is constructed before ripping it apart, and it will be much easier to put the garment back together when alterations are completed.
- Be extremely careful when ripping or cutting a garment. A small slip or accidental clip can ruin a garment and cause great expense to the store or business responsible for the garment.
- Make a daily plan so that as much work as possible can be completed. Some alterationists prefer to do the most difficult alterations early in their work day, saving the easier, more enjoyable tasks for later in the day.

DRESS ALTERATIONS

The waistline seam of a dress is a structural feature that does not appear in other garments such as skirts or jackets. Because the waistline seam is somewhat unique to a dress and is not duplicated in a bodice or a skirt, the alteration procedures included in this section focus primarily on adjustments made to waistlines. Other procedures used to alter dresses are the same as those used to alter skirts or blouses. Dress alterations that are discussed in this chapter include the following: lowering the waistline, raising the waistline, increasing the waistline, decreasing the waistline, and increasing the hip line.

Lowering the Waistline

A waistline that should be lowered will fall above the natural waistline, and the wearer of the garment may feel that it constantly needs to be pulled down. A very uncomfortable and unflattering fit results. The amount of alteration or lowering that can be done to the waistline of a dress relates directly to the amount of seam allowance already in the garment. Most ready-to-wear garments are constructed with a standard 5/8" waistline seam. If this is the case, the garment waistline could only be lowered by 3/8", leaving a 1/4" seam. Another option to correct this fitting problem would be the insertion of a separate placket or band at the waistline. This procedure usually changes the design of the dress significantly.

To correct a waistline that falls too high on the body, the following procedure may be used:

- Determine where the client's natural waistline is and mark the corresponding location on the skirt with a row of pins or tailor's chalk.
- Separate the bodice from the skirt by ripping the waistline seam.
- If there is a zipper, remove the lower portion extending 2" above the waistline; normally there is no need to remove the entire zipper.
- Pin the bodice and skirt back together using the new chalk or pin line for guidance.
- Sew the bodice and skirt together on the new bodice seam line. Do not change the skirt seam line as this will not lengthen the bodice. The new waist seam line will have a different amount of seam allowance on the bodice side than on the skirt side. Press the seam toward the bodice, trimming away any excess seam allowance as needed.

Raising the Waistline

When the bodice is too long, there is usually an excess amount of fabric that bunches up below the waist. The same procedure for lowering the waistline is followed for raising the waistline except the new waistline seam is pinned on the bodice rather than the skirt. The new waistline seam allowance is longer on the bodice side than the skirt side and may need to be trimmed.

Increasing the Waistline

Once the amount of fabric to be let out is determined, the skirt and bodice of a dress can be altered to increase the waistline and make a garment more comfortable for a fuller figure. The side seams may pull and any closures may be strained when the waistline is too tight. To correct a waistline that is too tight, the following procedure may be used:

- Rip the side seams open from the waistline seam. This opening should be 2" to 4" toward the underarm and 2" to 4" toward the hemline.
- Mark the new stitching line on the seam allowances with tailor's chalk or pins.
- Restitch each side seam along the new marking, tapering off to the original seam under the arm and down toward the hip line.
- Press the new seams open.
- If additional width is needed, release the waistline darts in equal amounts in both the skirt and the bodice. Resew the waistline seam.

Decreasing the Waistline

If the waistline is too loose, the excess fabric should be taken in and possibly removed. Unless this fit problem is excessive, it is often overlooked. Many clients may prefer some extra ease in the waistline area and it can easily be disguised by a belt. This fit problem appears on the garment as too much fabric around the waist. The same procedure for increasing the waistline is followed for decreasing the waistline except that the seams are taken in rather than let out.

Increasing the Hip Line

If the hip line of a dress without a waistline needs to be increased, the bodice of the dress may be too long and have excess folds of fabric around the waistline. The bodice area is actually being prevented from falling into place because the dress is not sliding over the hips. An inexperienced fitter may look at a dress with this fit problem and decide that the fullness should be removed by altering the bodice. However, the right procedure to correct the problem is to add more width to the hip line area. To correct a bodice that is too long on a dress without a waistline seam, the following procedure may be used:

- Rip the side seams apart from 2" below the waist to approximately 6" to 8" below the hip line.
- Mark the new stitching line on the seam allowances with tailor's chalk or pins.
- Restitch the side seams along the new markings, tapering off to the original seam.
- Press the new seam open.
- Release the center front seam and center back seam if the garment has these seams and additional width is needed.

BLOUSE AND SHIRT ALTERATIONS

The basic components of a blouse or shirt are the neckline, shoulders, bodice, and sleeves. Each of these areas is discussed individually, and procedures may be adapted when altering other garments. As stated in Chapter Thirteen, some of the following procedures may be used when altering jackets, coats, dresses, blouses, or evening gowns. For example, few alterations are done to men's shirts, but those shirt alterations that are required correspond to alterations used to adjust a woman's bodice or blouse. Several alterations described in this section may also be used to alter jackets.

Neckline Alterations

As discussed in Chapter Thirteen, it is important that the neckline of a garment fit perfectly. Various problems may cause the neckline to fit poorly. For example, a neckline may gap if it is too large or cause discomfort if it is too small. The following neckline alterations are discussed in this chapter: decreasing back neckline fullness, increasing back neckline fullness, decreasing front neckline fullness, and lowering the neckline.

Decreasing Back Neckline Fullness – A neckline that has too much fullness in the back has vertical folds in the back bodice, and the back stands away from the body rather than fitting the body closely. To correct a neckline with fullness in the back, the following procedure may be used:

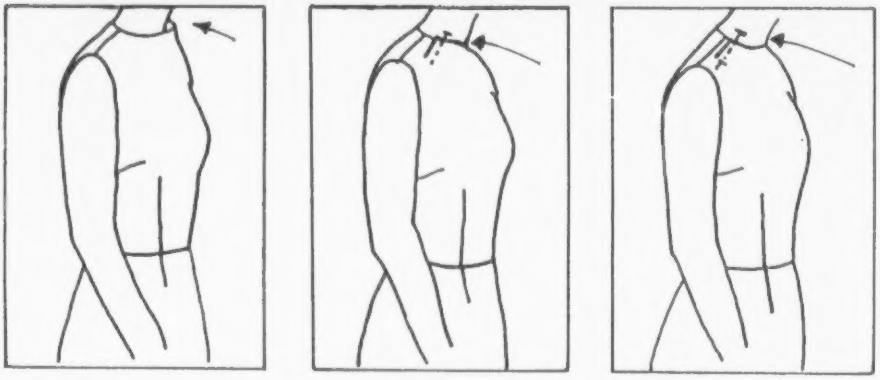
- Determine the amount of fullness to be removed by pinning the excess fabric down one side of the zipper. If the garment does not have a zipper, pin the excess fabric along the center back seam. Taper this pin line to the bottom of the zipper or center back seam.
- Record the amount of fullness to be removed on the alteration tag.
- Transfer the pin line marking with tailor's chalk and remove the pins.
- Rip the zipper away from the bodice, beginning at the neckline and continuing to 1/2" below the chalk marking.
- Press the original seam line to eliminate the crease. Fold the fabric along the chalk marked line to create the new seam line. Press the new seam line in place.
- Restitch the zipper, sewing the underside of the zipper first and then stitching the overlapping seam.

Increasing Back Neckline Fullness – If the back neckline is too tight, releasing the zipper seam may be difficult because of the limited amount of seam allowance. Releasing the front of the bodice may reduce some of the stress in the back neckline; if the problem is severe, it is unlikely that it can be successfully altered.

Decreasing Front Neckline Fullness – A neckline that has too much fullness in the front stands away from the neck and chest rather than fitting the body closely. This fitting problem and optional alterations are illustrated in figure 14.3.

To correct a neckline with excess fullness in the front, the following procedure may be used:

- Pin the excess fullness out of the neck by making small tucks or darts of equal amounts on both sides of the bodice.
- Remove the excess fabric from the shoulder seams in equal amounts if more than 1" of fullness is being removed.
- Use a piece of seam tape cut 1" longer than the neckline measurement to adjust the fullness.
- Match the center front of the garment to the middle of the seam tape and pin the garment and seam tape together on the stitching line.
- Stitch the seam tape to the neckline seam, easing the neckline fullness into the seam.
- Clip the seam tape and the seam line to allow the neckline to lie flat.
- Press the neckline using a damp press cloth to shrink out the excess fullness. To ***shrink out*** is to make an area on a garment smaller with the use of heat, moisture, and steam.



Fullness In Front Neckline

Front Neckline Fullness Reduced with Darts

Front Neckline Fullness Removed In Front Shoulder Seam

Figure 14.3

Lowering the Neckline – Lowering the neckline is a necessary alteration if the neckline is too tight or too high. In either case, it is necessary to locate a new neckline on the garment that is comfortable for the client. To correct a neckline that is too tight or too high, the following procedure may be used:

- Mark the new neckline with pins; replace the pins with thread markings.
- Remove the facing from the garment.
- Staystitch the entire neckline to prevent unnecessary stretching.
- Trim the neckline to 5/8" from the line of staystitching.
- Lay the new neckline flat on a piece of paper. Trace around the neckline curve. Remove the garment. Measure an equal distance from the traced curve all around the neckline curve to create a new facing pattern. Cut the new facing from the same or similar fabric, making sure the fabric is cut on-grain.
- Staystitch the neckline edge of the new facing.
- Sew the new facing to the new neckline using a 5/8" seam allowance.
- Clip the seam and press it open so that it lies flat.
- Trim the new seam line as needed and press as needed.

If the new neckline falls below the top of the zipper opening, the zipper must be removed. The zipper should be sewn in after the new neckline and facing have been attached using the same zipper application procedure that was used originally.

Shoulder Alterations

The shoulder area is another area of a garment that should fit perfectly. Many men's garments are sized primarily by the shoulder width. It is best to choose a garment that fits as closely as possible in the shoulder area. Other areas of the garment can then be altered as necessary. Shoulder alterations that will be discussed in this chapter are as follows: decreasing shoulder width, increasing shoulder width, decreasing fullness at shoulder and neckline, and decreasing fullness around armholes.

Decreasing Shoulder Width – If the shoulders of a garment are too wide, they hang off the body and form vertical folds between the armhole and the bust. Usually, this alteration of the sleeve and shoulder affects the side seam of the bodice. When the shoulder seam is shortened, the armhole becomes larger due to excess fabric from the shoulder being removed. The bodice side seam must be taken in for the sleeve to fit into the larger hole. A seam is ***taken in*** by sewing larger seam allowances than were originally sewn in the garment. To correct the problem of shoulders that are too wide, the following procedure may be used:

- Pin out the excess fullness by pinning a vertical tuck at the shoulder seam down through the bust area. To ***pin out*** is to remove the excess fabric by inserting straight pins through tucks of fabric. This procedure should raise the shoulder seams to the correct positions on the body.
- Measure the amount of fabric pinned in the tuck and mark that amount at the top of the shoulder seam; continue a line of marking toward the original armseye seam, tapering until the original armseye seam is reached.
- Rip the sleeves away from the bodice, being sure to mark each sleeve and shoulder with matching symbols so that each sleeve is reset in the correct armhole. Also mark the top of the sleeve at the shoulder seam line so the grain line will not be changed during the alteration.
- Trim the new sleeve line to 5/8", tapering down to the bottom of the armhole. Do not trim any fabric on the sleeve itself.
- Take in the bodice side seams as much as necessary so the sleeve fits into the new armhole.
- Pin the sleeve back into the armhole. Some easing may be required when resetting each sleeve into the armhole. If there is no staystitching on the sleeves, it may be helpful to apply staystitching to the tops of the sleeves.
- Stitch the top of the sleeve and the armhole together. A double row of stitching, one row 5/8" and one row 3/8" from the edge, will help strengthen the armseye seam.
- Trim and grade the seam as needed. Press the seam toward the sleeve.

Increasing Shoulder Width – Altering a garment that is too tight across the shoulders can be time consuming and difficult. To successfully complete this alteration, there must be enough fabric in the seam lines to correct the problem. More expensive garments such as high quality men's suits are manufactured with extra wide seams to help achieve a perfect fit through alterations. The success of the alteration will also depend on how tight the garment is and if it is constructed with certain design lines. The areas that can be let out, if they exist, are the center back seam, shoulder darts, shoulder seams, and princess line seams.

Decreasing Fullness at Shoulder and Neckline – When the garment does not sit on the shoulders but rides up along the neckline and underarm areas, the shoulder line is too high. Even if the bodice fits in all other areas, the bust darts fall at the right place, and there is ample ease through the back, high shoulder seams can cause the neck and underarm to fit poorly. To correct the problem of a high shoulder line, the following procedure may be used:

- Pin out the fullness in the shoulder seam. If the fullness is located in either the front or back, the excess fabric should be pinned out on the corresponding part of the body. If the amount of change needed is equal to the front and back, the measurements should be equal on both sides of the shoulder seam.
- Measure the amount of fabric that has been pinned. Make a note of the amount of excess fabric on the alteration tag.
- Mark the new shoulder seam line with tailor's chalk.
- Separate any facings, collars, or sleeves from the shoulder seam. It may not be necessary to remove them completely. Reduce the size of each of these garment pieces to fit into the new shoulder area. If the alteration is slight, it may be possible to ease these pieces back into the shoulder area.
- Stitch the new shoulder seam line before removing the old shoulder seam line.
- Trim the new seam line to 5/8" and remove the old stitches from the original seam line.
- Press the new shoulder seam open.

Decreasing Fullness Around Armholes – A common figure problem is sloping shoulders. A slight slope can be ignored or camouflaged by adding thin shoulder pads. ***Shoulder pads*** are pieces of foam or padding that are shaped to fit over the shoulder and provide a tailored contour to a garment. A pronounced slope may need padding and altering. This figure problem causes a garment to gather and produce folds at the front armholes. If the problem of sloping shoulders affects a coat or suit jacket, it should be resolved with thicker shoulder pads rather than any seam line alteration, as shown in figure 14.4.

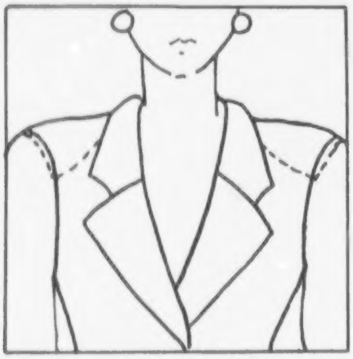


Figure 14.4

The following procedure may be used to decrease fullness around armholes:

- Pin out the fullness in the bodice under the arms to the shoulder seam. The largest amount of excess fabric will be at the armhole edge tapering into the original seam at the neck. There should not be more than 3/4" pinned out of the armhole.
- Measure the amount of fabric that has been pinned. Write the amount of excess fabric on the alteration tag.
- Mark the new shoulder seam line with tailor's chalk. The new seam line should taper from the armhole toward the original seam at the neckline.
- Trim the seam as needed and press open.
- Reset the sleeve into the new armhole. It should not be necessary to remove the sleeve from the bodice and adjust the bodice side seams because of the small amount of fabric altered in this procedure. There should be enough ease in the sleeve cap that it can be easily sewn back to the bodice.

Bodice Alterations

There are several areas of the bodice other than the neck and shoulder areas that can be altered. One of the primary techniques used for changing bodices is through the use of darts; darts may be added, removed, relocated, or increased or decreased in size. Darts can be added to take up fullness; darts may be let out to provide more ease. There are several different types of darts used on women's garments. There are no darts on men's garments. The following bodice alterations are discussed in this chapter: increasing bodice fullness, decreasing bodice fullness, shortening bust darts, shortening waistline darts, and removing waistline darts.

Increasing Bodice Fullness – When the bodice area of a garment is too tight, it can be very uncomfortable. A garment with this fitting problem pulls across the back and chest; fasteners (such as buttons, hooks, zippers, and snaps) are strained and gaps are created. To correct the problem of a too tight bodice, the following procedure may be used:

- Pin along the side seams of the bodice indicating the amount of fabric to be released from the side seams.
- Measure the distance from the pin line to the seam line and make a note of this measurement on the alteration tag. This is the amount to be released from the side seam. The amount that can be released depends on the width of the seam allowance.
- Mark a new seam line with tailor's chalk on the seam allowance if there is no seam guide on the sewing machine used.

- Rip the bodice side seams completely apart; remove any hem on the lower edge of the bodice at the side seams and any facings attached to the armholes. In most cases, the entire side seam must be released to solve this fit problem.
- Release a portion of the armseye seam if there is a sleeve. Begin releasing the armseye seam at the center of the underarm. Release the armseye seam about 2" to 3" both directions (toward back and front of armseye). Before ripping, check to see if the sleeve has enough ease so that it will fit in a larger armhole without being ripped apart too much. The less sleeve reconstruction necessary, the easier and less time consuming this alteration becomes.
- Press out the original crease of the side seam.
- Restitch the new side seam.
- Press the new side seam open.
- Ease the sleeve back into the new armhole and sew into place if the sleeve has been ripped apart.

Decreasing Bodice Fullness – The same procedure for increasing fullness around the bodice is followed for decreasing fullness around the bodice, except that the side seams are taken up rather than let out. The armseye seam should be ripped out by beginning to release the seam at the underarm. The armseye seam is ripped 2" toward the front and 2" toward the back of the seam so that fullness can be removed.

Shortening Bust Darts – The bust darts in the bodice should point to the bust but not extend beyond the bust point. The possibility of altering darts depends on whether the manufacturer has clipped or marked the darts in a way that prohibits them from being altered. To shorten a bust dart, the following procedure may be used:

- Determine where the dart should end and mark that spot with a pin.
- Measure the new length of the dart and make a note of that measurement on the alteration tag.
- Release each side seam only where the dart intersects the side seam. Do not release stitching on the dart.
- Mark a new stitching line for the dart, if necessary, beginning on the original dart stitching line and tapering to the point where the new dart should end.
- Begin stitching the dart on the original dart line at the side seam.
- Taper the stitching to the new point of the dart.
- Remove the stitching line of the old dart and press.
- Restitch the side seams and press open.

Shortening Waistline Darts – The same procedure is used for this alteration as the one described for shortening bust darts, except that the waistline seam is released where the darts intersect it. It is only necessary to release the section of the waistline seam that allows access to the waistline darts.

Removing Waistline Darts – Sometimes it is best to remove waistline darts completely, allowing easier movement. This alteration may be used to alter a garment for a full figure. The garment should be fitted to determine if waistline darts in the front of the bodice, in the back of the bodice, or in both the front and back should be released. To correct the problem of tight waistline darts, the following procedure may be used:

- Record on the alteration tag approximately how much and where the ease is needed (front, back, or both front and back). No markings on the garment are usually necessary when fitting the client.
- Use the following procedure if fullness is needed in the back of the garment:
  - Release the waistline seam across the back, stopping 1" short of each side seam for a garment with a waistline seam and no zipper.
  - Release the back waistline seam without releasing 1" to 2" of seam line that intersects with the zipper for a garment with a waistline seam and a zipper.
  - Release the dart stitching and press the creases out of the bodice.

  - Follow procedures described in Chapter Twelve for easing and gathering seams to ease or gather the bodice seam allowance to the skirt seam allowance.
  - Restitch the waistline seam in the back of the bodice.
- Use the following procedure if fullness is needed in the front of the garment:
  - Release the waistline seam in the front of the bodice 3" on each side of each dart.
  - Release the dart stitching and press the creases out of the bodice.
  - Follow procedures described in Chapter Twelve for easing and gathering seams to ease or gather the bodice seam allowance to the skirt seam allowance.
  - Restitch the waistline seam in the front of the bodice.
- Release the bodice side seams and stitch narrower side seams if additional bodice fullness is needed. When restitching the waistline seam, match each bodice side seam to the corresponding skirt side seam.
- Press the new waistline seam toward the skirt.

Sleeve Alterations

One of the last areas of the bodice to be altered is the sleeves. It is important to look at the sleeves once all other portions of the garment are altered. The sleeves should be in proportion to the rest of the garment and hang in the manner the designer intended. Sleeve alteration procedures discussed in this chapter are as follows: increasing fullness in sleeves, increasing ease in sleeves by inserting gussets, decreasing width in sleeves, and shortening cuffed sleeves.

Increasing Fullness in Sleeves – One method for altering sleeves that are too tight around the circumference of any part of the arm is to let out seam allowances. To correct the problem of tight sleeves, the following procedure may be used to let out each sleeve seam allowance:

- Place pins on the underarm seam of the sleeve indicating where the seam should be let out. Write on the alteration tag how much the sleeve must be let out.
- Determine if there is enough seam allowance to use this method or if a gusset is required.
- Release the armseye seam beginning at the intersection of the armseye seam and the side seam if the seam allowance is to be released. Release 2" in each direction.
- Release the original sleeve seam line in the area of the sleeve where additional fullness is needed.
- Stitch a new sleeve seam line beginning at the old seam line and tapering to the end of the seam that intersects with the armseye seam. Press the old crease marks out of the sleeve and press the new sleeve seam open.
- Restitch the armseye seam, easing the extra fullness of the sleeve into the armhole.

Increasing Ease in Sleeves by Inserting Gussets – Another method of adding fullness to sleeves is by inserting gussets. A ***gusset*** is a diamond-shaped piece of identical or similar fabric inserted to provide more ease of movement and increased strength. It is important to have enough of the original fabric to make gussets. To apply a gusset to a sleeve, the following procedure may be used:

- Mark the place on the sleeve where the addition of ease can stop.
- Release the sleeve seam from under the arm to the marked point on the sleeve. Backstitch the sleeve seam at this marked point. Release the armseye seam about half way to the shoulder seam in the front and back.
- Cut the diamond-shaped gusset from the same fabric as the garment. Cut the piece longer than the alterations indicate and wide enough to accommodate four seam allowances. Mark the point on the smallest end of the gusset that will match the point at the end of the sleeve seam.

- Match and pin the gusset to the sleeve seam allowances with right sides together.
- Stitch the gusset to the sleeve, taking extra care to match the point of the gusset with the ending point of the sleeve seam line. Both gusset seams will be matched to this point exactly. This will help the sleeve lie smooth and not bulge at the intersection.
- Ease the enlarged sleeve back into the armhole. The amount of easing necessary to reset the sleeve will depend on the width of the gusset and how much bigger the sleeve has been made. It may be necessary to let out the side seam of the bodice slightly to accommodate the larger sleeve. This option can be used only if the fit of the garment is not affected by releasing the side seams.
- Press the new gusset seam lines and the armseye seam.

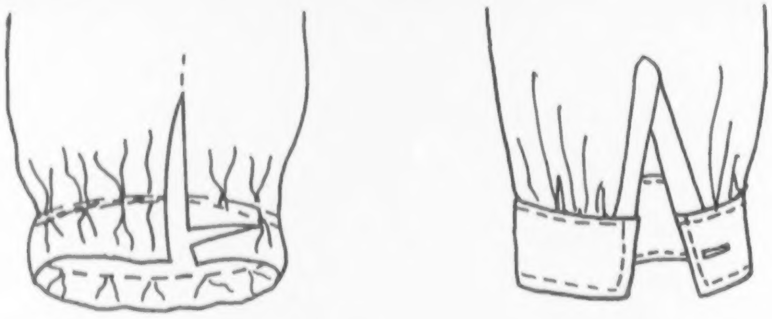
Decreasing Width in Sleeves – When a sleeve is too loose it may detract from the overall appearance of a garment. A sleeve that is too loose may not be noticed by the client, so the fitter should be able to detect this fit problem. The alteration procedures used for a short sleeve and a long sleeve are basically the same.

To correct the problem of loose fitting sleeves, the following procedure may be used:

- Pin out the excess fabric along the sleeve seam. Measure the amount of fabric taken up and note the amount on the alteration tag.
- Once the garment has been removed from the body, mark the new sleeve seam line on the inside of the sleeve with tailor's chalk.
- Release the armseye seam and the hem of the sleeve partially if fullness is being taken out of the entire sleeve. If only the lower portion of the sleeve is adjusted, it is not necessary to release the armseye seam. If only the upper portion of the sleeve is adjusted, it is not necessary to release the hem of the sleeve. If only a small amount of fullness is taken up, it may be possible to taper the stitching to the old seam lines at one or both ends of the sleeve. Using this procedure eliminates the need to release the armseye seam and/or the hem of the sleeve.
- Stitch the new sleeve seam line beginning at the armhole and stitching toward the hem of the sleeve.
- Rip out the old seam line and press the new seam open.
- Reset the sleeve into the armhole. If too much of the sleeve has been taken up, the side seam may need to be adjusted a small amount to accommodate the smaller sleeve. This option can be used only if the fit of the garment is not affected by taking up the side seams.

Shortening Cuffed Sleeves – Altering cuffed sleeves that are too long is more involved than the simple lengthening and shortening processes discussed in detail in this chapter. This alteration is performed on men's shirts more often than on any other garment. To correct the problem of a cuffed sleeve that is too long, the following procedure may be used:

- Determine the exact measurement of the client's arm and record what the sleeve length should be on the alteration tag.
- Pin the amount of fabric that should be taken up at the base of the sleeve but above the cuff. Make a note of this measurement on the alteration tag.
- Mark a chalk line on the sleeve to indicate the location of the new seam line.
- Remove the cuff and the placket from the sleeve.
- Place one or two rows of stitching 1/2" below the newly marked sleeve seam line, as shown in figure 14.5. This stitching will be used to ease or gather the sleeve to the cuff.
- Trim the excess fabric from the sleeve.
- Cut the placket opening the additional length needed for the placket to be reset. Stitch the placket back into place.
- Restitch the cuff to the sleeve edge easing or gathering as needed.



Easestitch After Removing Cuff **Reattach Cuff**

Figure 14.5

SKIRT ALTERATIONS

Although there are many different styles of skirts, they are all relatively easy to alter. Skirts with unusual design lines such as scalloped hems, decorative borders, or pleats may require more time to alter; the alteration can usually be accomplished successfully with time and patience. Skirt alterations discussed in this chapter are as follows: increasing the waistline, decreasing the waistline, increasing the hip line, and decreasing the hip line.

Increasing the Waistline

The waistline of a skirt can be designed many different ways. If a skirt has a waistband, it may have features such as belt loops, top stitching, and some type of closure. A skirt that does not have a waistband may have these same features, but they are attached to the skirt rather than to a waistband. A waistline that is too tight pulls at the side seams and the closures of the skirt, causing discomfort. To correct the problem of a tight waistline on a skirt with a waistband, the following procedure may be used:

- Determine the client's accurate waistline measurement and write the measurement on the alteration tag.
- Mark the skirt with tailor's chalk to indicate the amount of fabric to be released.
- Move the closure on the waistband to solve the problem if the skirt is slightly tight. If the problem cannot be solved by adjusting the closure, remove the waistband and the seam tape. Removing the seam tape will allow the waistline of the skirt to stretch.
- Release waistline darts, side seams, center front seam, and/or center back seam to increase the size of the waistline. It is best not to adjust a seam with a zipper because of the amount of time involved in adding seam allowance to the zipper and restitching the zipper. It is important to remember that equal amounts of ease should be released in corresponding areas of the garment.
- Release seams as needed to provide the required amount of ease. If this procedure does not provide enough ease, the darts can be removed or made smaller as described previously.
- Stitch each new seam, tapering to the original seam line.
- Cut a new waistband from identical fabric if necessary. Using the old waistband as a guide, cut a new waistband the correct length for the new waistline seam.
- Pin the new waistband to the skirt, matching center front, center back, and side seams.
- Stitch the waistband to the skirt. Trim the waistline seam and press the new waistband.

Decreasing the Waistline

A garment that is too loose at the waist does not hang properly and does not hold its proper shape. If the garment is belted, excess folds of fabric may appear around the waistline. The same procedure for increasing the waistline is followed for decreasing the waistline, except that the side seams are taken up rather than let out. The fullness in the skirt can be taken up in the side seams, center front seam, center back seam, and waistline darts. It is not necessary to cut a new waistband. Some of the original waistband may need to be trimmed to match the smaller waistline of the skirt. As mentioned in the preceding alteration procedure, equal amounts of fabric should be taken in from corresponding areas of the garment.

Increasing the Hip Line

When a skirt is too small in the hips, it pulls at the side seams and causes gathers to form at the hip line and possibly in the abdomen area. It is relatively easy to correct this fitting problem if the seam allowances are wide enough to be let out. To alter a skirt that is too tight through the hip line, the following procedure may be used:

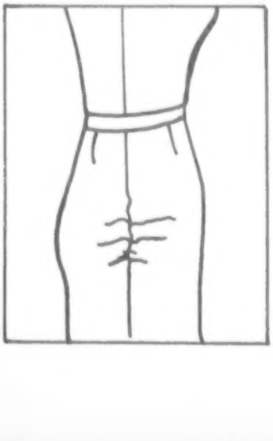
- Mark the side seams with tailor's chalk, indicating where the seam should be let out. Mark where the new seam should stop and taper into the original seam.
- Let out the side seams an equal amount from the hip line to the bottom edge of the skirt if the design of the skirt makes this necessary. Release the hem approximately 2" to 3" on either side of each side seam.
- Stitch the new seam line, tapering the new seam line into the original seam line at both the top and bottom edges of the skirt.
- Remove the original seam line where it has been replaced with a new seam line. Press the seam open and restitch the hem if it was released.

Decreasing the Hip Line

A skirt that is too large through the hip area appears too bulky, and folds of fabric may appear. This fit problem is not as noticeable or common on the female figure as skirts that are too tight. The same procedure for increasing the hip line is followed for decreasing the hip line, except that the side seams are taken up rather than let out. There will be a greater amount of fabric in the seam allowances rather than a smaller amount. This excess fabric may need to be trimmed from the hip area to reduce bulk.

SLACKS AND PANTS ALTERATIONS

Slacks and pants are altered in much the same way as skirts. The waistband and hip line are similar in both garments and require the same procedures for increasing or decreasing fullness. Slight variations of these procedures may be required when altering men's pants. For example, many of the fit problems that occur in men's pants can be solved by increasing or decreasing the center back seam. There is usually a wide seam allowance in this area of men's pants specifically for alteration purposes. The following slacks and pants alterations are discussed in this chapter: increasing fullness in crotch and decreasing fullness in crotch.



Increasing Fullness in Crotch

When slacks or pants are too tight through the crotch area, diagonal gathers form in the front and back crotch area. This can be an uncomfortable fit problem. Lowering the rise can alleviate this problem to some extent. The rise, or crotch depth, is described in Chapter Ten. To alter slacks or pants that are too tight through the crotch by lowering the rise, the following procedure may be used:

- Determine the amount of additional ease needed by comparing the garment measurement and the body measurement. The crotch seam should fall approximately 1/2" to 1" below the body. Write the amount of additional ease needed on the alteration tag.
- Check the amount of seam allowance tucked in the waistband by releasing a small amount of the waistband before ripping the entire waistband off. Determine if there is enough extra fabric for the alteration.
- Release the waistband from the slacks or pants in the front if the crotch is tight in the front only. If the crotch is only tight in the back, release the waistband in the back. Mark the new seam line with tailor's chalk along the upper edge of the waistline.
- Stitch the waistband back on the slacks or pants along the new waistline seam.
- Press the new waistline seam.

Another method for correcting the fit problem of a tight crotch is to stitch new seams in the crotch area. To correct slacks or pants that are too tight through the crotch by enlarging the crotch area, the following procedure may be used:

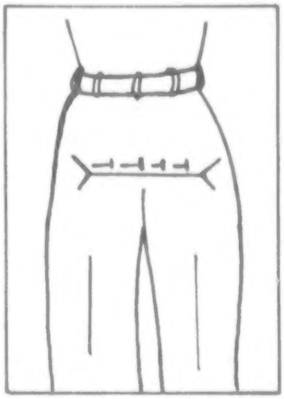
- Determine the amount of additional ease needed by comparing the garment measurement and the body measurement. The crotch seam should fall approximately 1/2" to 1" below the body. Record the amount of additional ease needed on the alteration tag.
- Mark the new seam line with tailor's chalk. Draw the chalk line following the shape of the center front seam and the center back seam.
- Release approximately 2" to 3" down all four seams that intersect at the crotch.
- Stitch the new seam lines together, adding the needed amount of ease and tapering into the original seam lines.
- Trim the new seams and press them open.

Decreasing Fullness in Crotch

When the crotch falls more than 1" below the curve of the body, it is too long and makes the slacks or pants look baggy. Unless the pants are designed to be baggy and have a low crotch, this fit problem should be altered. The same procedures for increasing crotch fullness are followed for decreasing crotch fullness, except that the crotch is taken up rather than let out.

A pair of slacks or pants can appear too big in the seat by hanging too far below the curve of the body. This excess fabric is tucked and pinned by the fitter as shown in the illustration. The tuck should not measure more than 1 1/2" if this procedure is used. The following procedure may be used to correct a pair of slacks or pants that are too long through the seat:

- Measure the amount of excess fabric in the tuck pinned by the fitter. Write this measurement on the alteration tag.
- Release the seams in the crotch area 2" on the center front and back seams and down to the knees on the inseams.
- Mark a new seam line on the back parts of the legs decreasing ease the amount measured in the tuck. Because the fullness is only in the back, do not adjust the front of the pants.
- Pin the front and back pants together, matching the new seam line on the back to the original seam line on the front.
- Stitch the seams together. Trim the seam allowance as needed. Press the seam open.



JACKET ALTERATIONS

Many of the characteristics of a jacket are similar to those of a blouse or shirt. This section includes some of the procedures that are commonly used to alter a tailored coat or jacket. The shoulder width, neck length, sleeve length, and overall height of the client are the factors that influence the fit of a jacket. Jacket alterations discussed in this chapter are as follows: decreasing back neck fullness, decreasing shoulder width in the back, increasing shoulder width in the back, increasing fullness in the abdomen area, and decreasing fullness in the abdomen area.

Decreasing Back Neck Fullness

A jacket that does not fit the neck properly develops horizontal lines directly under the collar. This problem may be corrected by shrinking out the fullness with a steam iron and extra moisture. Shrinking out the fullness can only be successful if there is a small amount of excess fabric; otherwise, the alteration should be made at the collar. To correct the problem of fullness under the collar, the following procedure may be used:

- Pin out the extra fullness under the back collar. Measure the amount of fabric pinned out and write that figure on the alteration tag. If the measured amount is more than 3/4", this alteration method should not be used.
- Separate the back of the collar from the jacket to correct a slight bulge at the collar seam line.
- Mark a new collar seam line with tailor's chalk or pins to correct a slight bulge. Measure from the old seam line the amount listed on the alteration tag.
- Remove excess fullness in the shoulder area and the back collar seam line for a more severe bulge. To remove fullness from both places, release the collar seam and shoulder seams from the neck to about 1" from the armseye seams. Do not release the armseye seams. Figure 14.6 illustrates the areas that should be released.
- Mark a new collar seam line and new shoulder seam lines for a severe bulge; increase the shoulder seams to remove the same amount of fullness removed from the collar seam line. Taper each new shoulder seam to the width of the original shoulder seam where it intersects with the armseye seam.
- Restitch the shoulder seams along the new seam lines, increasing the shoulder seam allowance as needed.
- Press the shoulder seams.
- Attach the collar the the jacket using the new collar seam line marked on the jacket.
- Trim and press the new seams.

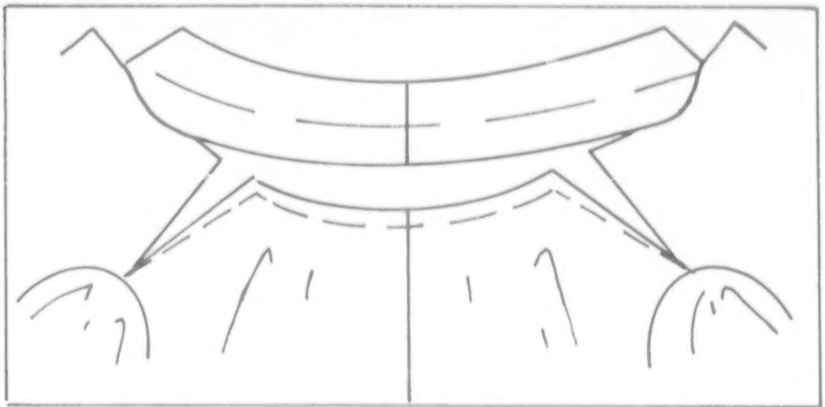


Figure 14.6

Decreasing Shoulder Width in the Back

The shoulder seams of a jacket should not extend beyond the natural shoulder more than 1/2". Taking a jacket up through the center back seam corrects most shoulder fit problems; however, this alteration may need to be done in combination with decreasing shoulder width in the front if the problem is excessive. To correct the problem of too much width through the shoulders, the following procedure may be used:

- Grasp the excess fabric along the center back seam until the armhole seams move into their proper places.
- Mark the new seam line down the center back. Indicate where the new seam line should taper into the original seam line by marking an *X* with tailor's chalk at that point. Measure the amount to be taken up and write that figure on the alteration tag.
- Stitch the new seam along the center back, tapering the new seam into the original seam at the marked location.
- Remove the collar from the jacket and separate the upper and under collars from each other.
- Cut the collar at the center back and stitch a center back seam if the collar has no center back seam. The seam allowance should include the same amount of excess fabric taken up across the back of the jacket. Alter the upper and under collars in the same manner. Stitch the upper and under collars back together.
- Stitch the collar to the jacket.
- Trim and press the new seam open.

Increasing Shoulder Width in the Back

When a jacket is too small through the back, horizontal wrinkles form, and the center back, armseye, and/or side seams may be strained. The same procedure for decreasing shoulder width is followed for increasing shoulder width, except the center back seam is let out rather than taken up. The amount of fullness to be added depends on the size of the original seam allowance. The collar can be adjusted only if it has a center back seam that can be let out the amount the jacket is let out. If the jacket collar is constructed without a center back seam, a new collar must be constructed that will fit the increased size of the new neckline.

Increasing Fullness in the Abdomen Area

When a jacket is too tight around the abdomen, the fabric is strained at the buttons. This alteration involves similar procedures used to increase fullness in a bodice that is too tight around the abdomen. Buttons can be moved on a jacket about 1/4" to add extra ease. Usually 1 1/2" is the maximum amount of fullness that can be added to the front of a jacket. To add fullness in the abdomen area of a jacket, the following procedure may be used:

- Use tailor's chalk to mark the amount of fabric to be released along each side seam. Write this measurement on the alteration tag.
- Release the side seams from the hem up to the armseye seam. Do not release any of the armseye seam.
- Add extra seam allowance to the front of the jacket only if the jacket fits well in the back. However, if there is not enough seam allowance on the jacket front, some ease may be released from the back side seam allowance.
- Stitch the new seam line, tapering it from the armseye seam down to the hem.
- Trim the seam as needed and press it open.

Decreasing Fullness in the Abdomen Area

A jacket that is too large through the abdomen has an excessive amount of overlap in the front. As in the alteration procedure for increasing fullness in the abdomen area, only 1 1/2" can be removed from a jacket without losing the original design lines. The same procedure for increasing fullness in the abdomen area is followed for decreasing fullness in the abdomen area, except that the side seams are taken up rather than let out. Fullness should be removed from each jacket front seam allowance without decreasing fullness in the jacket back. This procedure helps preserve the original look and design lines of a jacket.

LENGTHENING AND SHORTENING GARMENTS

As stated in Chapter Thirteen, the majority of alterations are made on the hemlines of garments. Adjusting a hem is usually a simple alteration that should be done after all other alterations on a garment have been completed. Most lengthening and shortening alterations are made at the hemline; but, in some unusual situations the alteration is made at the waistline. There is usually not enough seam allowance at the waistline seam to allow lengthening a garment. However, a skirt can be shortened by removing fabric from the waistline. This alteration method is appropriate for a skirt with a special border at the hemline that cannot be changed, for example.

There are many types of hem finishes and hemming stitches that may be used for different types of garments and fabrics. These stitches and finishes are described in Chapters Nine and Twelve. When altering a ready-made garment, it is best to use the same hemming stitch and hemming finish that were originally used, if possible. If the original hem of the garment is poorly done or defective, the alterationist should choose the most appropriate method for replacing the hem. If a garment is sold unhemmed, like many men's and women's tailored pants and slacks, the alterationist should select the best method of hemming for the weight and type of fabric.

Some of the most common hem alterations discussed in this chapter are as follows: lengthening or shortening an uneven hemline, lengthening or shortening the hemline of a lined garment, and lengthening or shortening the hemline of a pleated garment.

General Guidelines for Lengthening and Shortening

- Have the client stand in front of a mirror, preferably a three-way mirror. It is important to have a full-length mirror so the client can see the hem; if there is no mirror, the client may tend to bend over to see the hem, causing the hem to be marked unevenly.
- Ask the client to stand straight but not rigid.
- Have the client wear the undergarments and shoes to be worn with the garment being altered.
- Ask the client where he or she wants the hemline.
- Let the garment hang for approximately twenty-four hours after releasing the original hem. This period of time allows for any stretching that the garment may experience and is especially important for circular skirts or garments cut on the bias.
- Attach the hem so that it is not visible from the outside of the garment, unless it is a topstitched hem.
- Make sure the entire hem is the same width.

Lengthening an Uneven Hemline

The amount of fabric turned up to form the original hem determines the amount a garment can be lengthened. When a garment is lengthened, the width of the new hem will be less than the width of the original hem. A hem width and hem finish should be selected that will result in a professional looking hem. To lengthen an uneven hemline, the following procedure may be used:

- Release the hem in the garment by clipping the threads. Lightly press the hem out, brushing away any lint or other material trapped in the hem.
- Mark a line around the entire garment, using the most appropriate marking method for thetype of fabric. This line indicates where the bottom edge of the garment will be.
- Determine how wide the hem should be. Mark a second line an equal distance below the first line around the entire garment. This line indicates where the hem will end.

- Trim the fabric on the line indicating where the hem ends, making the amount of fabric to be turned up for the hem exactly the same around the entire garment.
- Turn up the bottom edge of the fabric on the line indicating where the bottom edge of the garment will be. Stitch the hem in place using the most appropriate method of stitching.
- Press the hem as needed.

Shortening an Uneven Hemline

The same procedure for lengthening an uneven hemline is followed for shortening an uneven hemline, except that the hemline is taken up rather than let down. Also, when shortening a hemline, more fabric will be trimmed from the bottom edge of the garment to even the hemline and reduce bulk. As much fabric as needed can be reduced from the hemline. As the hemline is altered, the proportions of the garment change. For example, a full length formal gown may look inappropriate if hemmed to the knee or to street length.

Shortening the Hemline of a Lined Garment

Many types of garments are lined. As stated earlier in this chapter, garment linings must be altered along with the garment if a professional, well-fitting look is desired. The corners of lined garments should be treated with extra care. The facings in a garment may be fitted facings, or the garment may have self-facings. When altering a garment with either self-facings or fitted facings, there may be additional bulk and some hand stitching may be required.

Garments such as coats, skirts, and dresses usually have free-hanging linings that hang from the garment's waistband or shoulders and are attached by French tacks at the hemline. Garments such as jackets and vests usually have linings that are sewn securely into the garment's edges. These linings are called attached linings. Altering the length of a suit jacket is not advised because of the curves and design lines being adversely affected. The following procedure describes an alteration appropriate for shortening the hemline of a garment with a free-hanging lining:

- Separate the garment from the lining and release the hems of both the garment and the lining.
- Mark the new hemline on the garment with basting stitches. It is best to use a long-lasting method of marking since this alteration requires time and pressing to complete.
- Release the lining from the vertical facing approximately 4" along the opening of the garment. Example openings in garments are the center front of a coat and the slit in the back of a skirt. The amount of facing to be released depends on how much the garment needs to be shortened. Press the original hem creases out.
- Trim any excess fabric from the hemlines.
- Apply an appropriate hem finish to the new edge of the garment and the lining.
- Turn the garment hem up along the basting stitch that indicates the new bottom edge of the garment. Stitch the hem in place using an appropriate stitch.
- Turn the facing fabric back on its original vertical crease as indicated in figure 14.7.
- Hand stitch the facing and the lining together along the vertical seam. It is not necessary to stitch the lining along the hemline. Tack the lining to the garment with French tacks to hold it in place.

Lengthening the Hemline of a Lined Garment

The same procedure for shortening the hemline of a lined garment is followed for lengthening the hemline of a lined garment, except that the hem is let down rather than taken up. The possibility of performing this alteration depends on whether or not the hem is deep enough to lengthen the amount needed while also keeping enough depth in the hem. If the lining is an attached lining, separate the lining from the garment's edges to see if there is enough hem to lengthen the garment.

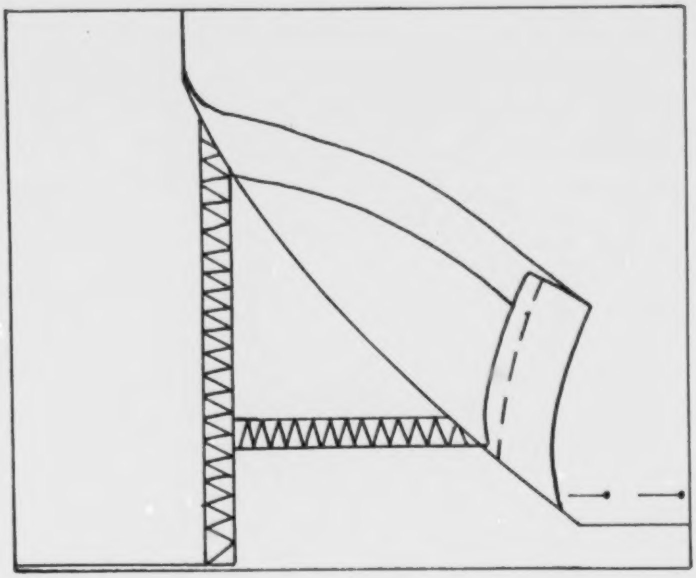


Figure 14.7

Shortening the Hemline of a Pleated Garment

Skirts or dresses that are pleated can be altered from the waistline or the hemline. Because the waistline alteration is less common and has been previously described, this procedure explains shortening a pleated garment at the hemline. A skirt, dress, or coat may have pleats strategically placed for design and/or for ease, or the entire garment may be pleated. More marking is usually required on pleated garments than on other garments in order to achieve an accurate hemline. For example, it may be necessary to mark on both sides of each knife pleat on a skirt so the new hemline will be even. To shorten the hemline of a pleated garment, the following procedure may be used:

- Mark the new hem on the garment using the most appropriate marking method. This line will become the bottom edge of the garment.
- Release the original hemline of the garment and press the crease out. Release any pleats that are sewn or tacked to the garment. Release any seams within pleats the amount required to shorten the garment.
- Trim any excess fabric from the hemline.
- Stitch any seams within pleats back to their original positions.
- Turn the hem up on the new hemline and stitch the hem in place using the most appropriate method of stitching.
- Press the hem as needed.
- Press the pleats carefully using pressing procedures described in Chapter Nine.

Lengthening the Hemline of a Pleated Garment

The same procedure for shortening the hemline of a pleated garment is followed for lengthening the hemline of a pleated garment, except that the hem is let down rather than taken up. As in all lengthening procedures, the amount of alteration allowed depends on how deep the original hem is. The new hem should have enough depth so that it looks neat and professional. Some pleated skirts, especially knife pleated skirts, may only have a shirttail hem or a rolled hem that cannot be lengthened.

ALTERING CHILDREN'S GARMENTS

Children's garments are generally easier to alter than adults' garments because a child's body has fewer curves to fit. Most alterations are not made to improve the fit of a child's garment but to increase the wearability (lifespan) of the garment. Since children grow rapidly and are not able to wear garments very long, performing complicated alterations on children's clothing is not usually recommended. Some children's clothing manufacturers use design features that allow a garment to be altered and worn longer. It is economically beneficial to buy children's garments with the following types of features:

- deep hems
- cuffed pants
- adjustable straps
- elastic waistlines
- extra buttons on straps

Points to Remember

- A person trained to view garments on the client, make fitting suggestions, determine what changes are possible, and mark the garment is called a fitter. An alteration tag is used to record alteration instructions.
- There are standard symbols used in marking garments for alterations.
- When a lined garment is altered, the lining should be altered in the same manner as the garment.
- A dress is usually comprised of a skirt and a bodice and can be altered according to the procedures described for these garments. The waistline seam is a unique feature of a dress and can be increased, decreased, raised, or lowered.
- The primary parts of a blouse or shirt that can be altered are the neckline, shoulders, bodice, and sleeves.
- Skirts can be altered at the waistline or at the hip line.
- Some alterations made to slacks and pants are like those made to skirts. In addition, the crotch area of slacks or pants may be altered to increase or decrease fullness.
- Alterations may be made to jackets to adjust back neck fullness, shoulder width, and fullness in the abdomen area.
- It is always best to purchase a garment that fits well in the neck, shoulders, and chest areas because altering these areas is sometimes difficult while altering the lower portion of a garment is relatively easy.
- The majority of alterations are made on the hemlines of garments. Lengthening or shortening is usually a simple procedure done after all other alterations are completed.
- Children's garments are usually altered to accommodate the growth patterns of children.
- It is economically beneficial to buy children's clothing with built-in features for lengthening, shortening, and expanding.

Words to Know

alteration tag
fitter
gusset
pin out
shoulder pads
shrink out
taken in

Questions for Review

1. Why is an alteration tag an important method of communication? Who uses the alteration tag to communicate?
2. What are some standard alteration symbols? What does each represent?
3. What are five general guidelines to follow to make altering ready-to-wear garments easier and more efficient?

4. What is the procedure for lowering a waistline on a dress?

5. What areas of a blouse or shirt are commonly altered?

6. How are shoulder pads used when altering a garment?

7. How may bust darts and waistline darts be adjusted to alter bodices?

8. What is a gusset? How are gussets used to alter sleeves?

9. What are two alternative methods of increasing fullness in the crotch area of slacks or pants?

10. What are five general guidelines for lengthening and shortening garments?

11. Why is extra marking required when hemming a pleated garment?

12. What are examples of wearability features one should look for when purchasing children's clothing? Why?

15

Quality in Apparel and Accessories

ESSENTIAL ELEMENT

- Identify signs of quality in clothing and accessories.(q6B)

OBJECTIVES TO ACHIEVE

- Assess social influences that affect apparel and accessory choices.
- Outline factors to consider when evaluating the quality of apparel and accessories.
- Identify laws that influence the quality of apparel and accessories.
- Determine how consumer rights, consumer responsibilities, and consumer agencies affect the quality of apparel and accessories.

There are several employment situations in which an individual may be required to assist customers or clients in assessing the quality of apparel and accessories. ***Accessories*** are items worn to enhance garments and create a complete outfit. Salespersons in retail stores often provide guidance to customers regarding clothing and accessory purchases. Salespersons in fabric stores and departments may be asked to assist customers in their selections. Personal shoppers select alternative wardrobe items for clients and must be familiar with signs of quality. Custom sewers, tailors, and dressmakers often guide clients in the selection of fabrics and notions. Therefore, knowledge of quality in clothing and accessories is an important aspect of employment in the textiles and apparel industries.

As discussed in Chapter Three, a customer is a person who purchases goods or services from a retailer. A consumer is the person who uses the goods or services. In order to assist customers and gain their trust, employees should understand signs of quality, care procedures, construction techniques, and principles and elements of design. Some customers select apparel and accessories wisely while others are unaware of factors to consider when making selections. These customers often need assistance from knowledgeable employees in order to make wise decisions.

SOCIAL INFLUENCES

The apparel and accessories an individual chooses are a result of a variety of influences. The image and first impression one wants to project and one's personality and lifestyle all influence apparel and accessory choices. Employees should assist customers in identifying the factors that influence their apparel and accessory choices.

An ***image*** is what people see and remember when they look at an individual. To project a positive image, individuals should have clean hair, body, teeth, and nails; maintain good health by eating properly and getting an adequate amount of exercise and rest; maintain good posture; display pleasant facial expressions and gestures; and wear clean clothing that fits properly and flatters the body. The image projected affects the first impression an individual makes.

A ***first impression*** is the opinion a person forms when first meeting someone. First impressions are usually based on immediate feelings or reactions to a person's appearance and what he or she is wearing. First impressions are important in situations such as business meetings and social gatherings. Once a good first impression is made, it can be reinforced with positive actions and words.

Each person's personality is expressed through the apparel and accessories he or she wears. ***Personality*** is made up of the characteristics that distinguish an individual, such as feelings, actions, and thoughts. The apparel and accessories individuals wear project how they see themselves and how others see them. Personality is sometimes judged on the apparel and accessories a person wears.

Lifestyle also affects the apparel and accessory choices an individual makes. ***Lifestyle*** consists of the activities in which a person is involved and the places she or he goes. Apparel and accessories should be appropriate for the type of lifestyle a person leads.

Values, Needs, and Wants

The quality people desire in ready-to-wear garments, accessories, and custom sewn garments depends on individual values, needs, and wants. Employees should assist customers in determining their values, needs, and wants. ***Values*** are the ideas, beliefs, principles, and standards that are important to a person. ***Needs*** are essential items a person cannot do without. ***Wants*** are items desired to make life more enjoyable.

Employees should attempt to gain the following information from customers in order to assess their values, needs, and wants:

- What does the customer really need?
- What merchandise is available that will satisfy these needs?
- What are the differences in available merchandise?
- Which product best meets the customer's needs at the present time? in the future?
- Is the customer able and willing to pay the required price?
- What benefits will the customer receive once the merchandise is purchased?

Once a customer's values, needs, and wants are determined, an employee can assist in establishing the quality of merchandise that will satisfy the customer. The employee can then assist the customer in making wise purchases.

GUIDELINES TO QUALITY

When choosing apparel and accessories to purchase, a customer should check and compare the quality of items. ***Quality*** is the degree of excellence or superiority of an item. The quality of apparel and accessories can be high, medium, or low.

High quality apparel and accessories offer superior construction, materials, and design. Characteristics that also indicate items of high quality include straight seams; detailed construction; secure stitching and fasteners; emphasis on fabric, cut, and line; matched patterns at the seams; and coordinated linings.

Medium quality apparel and accessories are durable and offer reliable construction, materials, and design. Medium quality items are priced less than high quality items but more than low quality items. ***Low quality*** apparel and accessories may be poorly made and offer only fair construction, design, and materials. In addition, they may become worn and unflattering quickly.

Although high quality items are usually more expensive than medium or low quality items, quality is not always related to price. For example, high quality apparel and accessories may be on sale for a lower price, or they may be sold in a store with low operating costs. Therefore, low price is not always a sign of low quality. Furthermore, low quality items may be sold at higher prices. Sometimes prices are increased to help pay for high operating costs. Increased prices can also be the result of a special trim or logo. Employees should be aware of apparel and accessories of different levels of quality and be prepared to assist customers in selecting the levels of quality that will best satisfy their values, needs, and wants.

Evaluating Quality

When evaluating the quality of apparel and accessories, customers should check and compare appearance, care, comfort, and durability. ***Appearance*** is the way something looks. The appearance of apparel and accessories is affected by types of fibers and methods of fabric construction, design features and construction, and fabric finishes. ***Care*** is the upkeep required to maintain the appearance of apparel and accessories. Apparel and accessories that require special care, such as dry cleaning, may actually cost the customer more than minimum-care items. ***Minimum care*** apparel and accessories do not require extensive care in order to maintain their appearances. In addition, minimum care items usually do not require ironing, do not soil easily, and do not require special care.

The ***comfort*** of apparel and accessories is judged by the absence of undesirable features and how well an item corresponds to climate and activity. Clothing that is too tight, irritating to the skin, or too warm is uncomfortable to wear. ***Durability*** refers to the ability to withstand hard wear or frequent use. When evaluating durability, customers should check characteristics such as design and construction, fiber content, fabric finishes, and colorfastness.

When evaluating the quality of apparel and accessories, employees and customers should consider the total appearance of items as well as specific features. Table 15.1 contains factors that influence the quality of apparel items in general, and table 15.2 contains factors that influence the quality of a variety of accessories.

Apparel Quality Checklist

Buttonholes
√ correct size for buttons and buttons lie flat
√ equal in length
√ evenly spaced
√ lie flat

Buttons
√ attached securely
√ placement is correct distance from edge of garment
√ thread shank used if required
√ button and choice of thread compliment garment

Collars
√ corners are turned so points are sharp
√ sides are matched and balanced
√ trimmed corners lie smooth
√ understitched to hold collar flat

Cuffs
√ clipped and trimmed to prevent bulkiness
√ pointed or curved, both sides alike

Darts
√ tapered gradually to a point
√ point of dart tied or backstitched
√ pressed flat toward the center back, the center front, or down

Fabric
√ on grain
√ plaids or stripes match at seams
√ fiber content is appropriate for use of garment
√ fabric construction is appropriate for use of garment

Facings
√ seam clipped and trimmed to about 1/4 inch
√ seam is caught underneath the understitching
√ edges finished according to fabric type

Gathers, Tucks, Pleats
√ spaced evenly
√ folded evenly in width
√ pleats folded in correct direction for pattern

Grain Line
√ cut and stitched with grain straight
√ hangs well without twisting

Hems
√ correct stitch for fabric and garment
√ proper width for garment style
√ lie flat
√ not obvious from the outside of the garment
√ fullness distributed equally

Hooks and Eyes
√ hidden
√ attached securely
√ neat, even stitches

Interfacings
√ appropriate weight for fabric
√ used in places that need extra firmness

Linings
√ appropriate weight for fabric
√ constructed slightly smaller than outer fabric
√ attached to garment with swing tacks

Pockets
√ balanced evenly on garment
√ attached securely
√ pointed or curved, both sides alike

Seams
√ thread matches fabric
√ seam allowance appropriate for fabric and garment
√ finished seam allowance if necessary
√ smooth and free of puckers

Sleeves
√ ease distributed so there are no puckers
√ underarm seam matched with side seam
√ grain line from shoulder to elbow perpendicular to floor
√ sleeve set smoothly into armhole

Waistbands
√ width even from one end to the other
√ grain line straight at both ends
√ adequate overlap for fastener

Zippers
√ blend with garment
√ stitching is even and inconspicuous
√ work freely
√ inserted smoothly with no bumps or puckers

Table 15.1

Factors That Influence the Quality of Accessories

Accessory	Examples	Signs of Quality
Belts	leather belts plastic belts sashes self-belts	• material used is appropriate for intended function • closure functions well • closure allows adjustment of belt • eyelets (holes) are reinforced • eyelets are equal distance apart • stitched on-grain to avoid diagonal wrinkles
Eyewear	prescription glasses sunglasses	• sunglasses block ultraviolet rays • construction is sturdy • lenses are free from scratches • cases available to store eyewear • eyepieces fold easily
Footwear	boots sandals shoes	• material used is appropriate for intended function • method of construction is appropriate for material used • flaws do not appear in material used to construct item
Gloves	knit gloves leather gloves woven gloves	• lining material is appropriate for material of glove • provide adequate warmth and/or protection • construction is sturdy • material used is appropriate for intended function
Handbags	attaché cases envelope clutches tote bags	• material used is appropriate for intended function • method of construction is appropriate for intended function • straps or handles are securely attached • closure operates properly and is appropriate for design • closure matches quality of material
Headwear	berets felt hats knit caps visors	• material used is appropriate for intended function • method of construction is appropriate for intended function • adequately keeps head warm or cool
Hosiery	pantyhose socks stockings	• material used is appropriate for intended function • even coloration • free from holes, runs, snags, flaws • packaging protects hosiery from damage • well constructed • durable
Jewelry	earrings necklaces tie clasps watches	• clasp holds well and appears sturdy • good quality material used • free from flaws, scratches, dents, and missing parts • construction looks sturdy • items such as watches function as intended
Neckwear	bow ties neckties scarves	• material used is appropriate for intended function • method of construction is appropriate for intended function • fringe on scarves does not ravel • fabric for scarves drapes well • fabric does not wrinkle easily • fabric does not ravel

Table 15.2

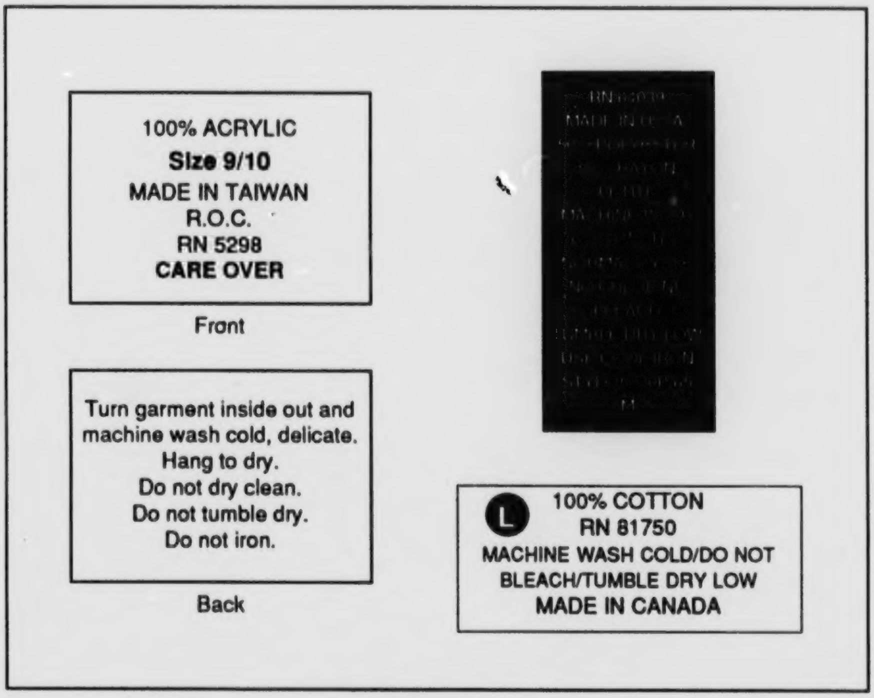
CONSUMER PROTECTION

To accurately evaluate the quality of apparel and accessories, customers and employees must understand other factors that influence the quality of apparel and textile products, such as apparel and textile laws and consumer rights and responsibilities. In addition to encouraging better quality, apparel and textile laws and consumer rights and responsibilities promote product safety, reliable service, and honest advertising. Employees should understand apparel and textile laws and customer rights and responsibilities and be able to explain them when necessary.

Apparel and Textile Laws

Labels and Hangtags – A ***label*** is a piece of cloth or ribbon that is permanently attached to a garment and provides information about the garment. The federal government requires that almost all textile products sold in the United States contain labels providing information on fiber content, country of manufacture, identifying number of the producer, and basic care instructions. The generic names of fibers must be included on labels rather than trademarks since many trademarks exist. Labels can also provide voluntary information such as trademark names of manufactured fibers, brand names of garments, information about the method of fabric construction, size of the garment, and names of special fabric finishes applied.

Permanent labels are usually stitched to garments at the back of the neckline or waistline or on a facing or side seam. As long as a label does not ravel, it may be of any style or color and information may be included on both sides if the label can be turned over. Examples of labels are shown in figure 15.1.



100% ACRYLIC
Size 9/10
MADE IN TAIWAN
R.O.C.
RN 5298
CARE OVER

Front

Turn garment inside out and
machine wash cold, delicate.
Hang to dry.
Do not dry clean.
Do not tumble dry.
Do not iron.

Back

Ⓛ 100% COTTON
RN 81750
MACHINE WASH COLD/DO NOT
BLEACH/TUMBLE DRY LOW
MADE IN CANADA

Figure 15.1

Some labels may be detachable. ***Detachable labels*** are intended to be removed from garments and are usually attached to garments by a plastic band, a string, a straight pin, or a staple. A ***hangtag*** is a detachable label made of heavy paper or cardboard. Hangtags are often hung from zippers, sleeves, underarm seams, buttons, buttonholes, or belt loops. Hangtags often include the same information found on labels. Much of the information included on hangtags is voluntary, such as information about special finishes, reinforced pockets, logos, guarantees, or seals of approval. Examples of hangtags are illustrated in figure 15.2.

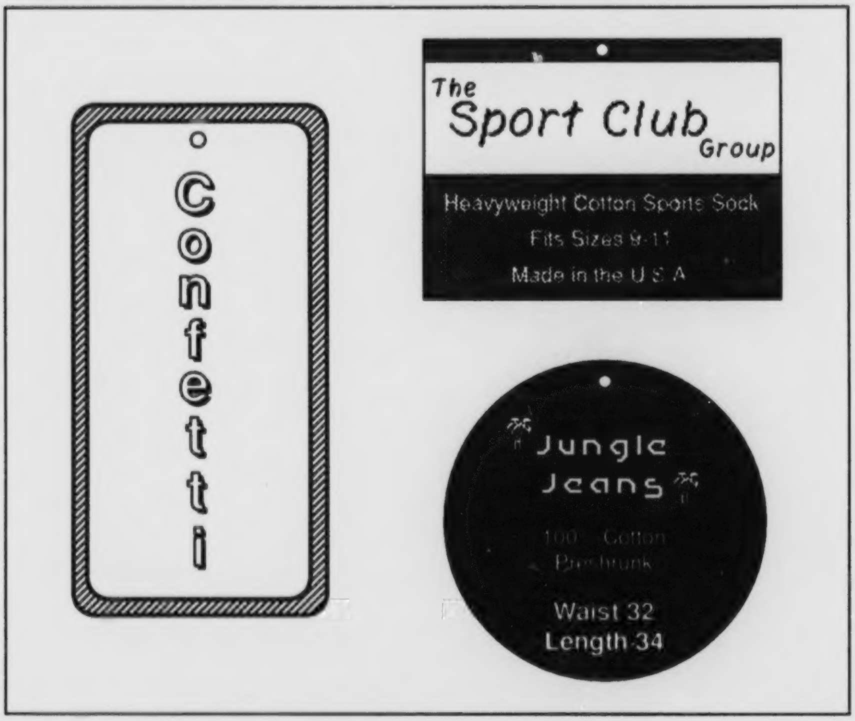


Figure 15.2

1972 Care Labeling Act – The ***1972 Care Labeling Act*** requires all finished garments and fabric sold for making apparel to have attached labels describing procedures for regular garment maintenance. Labels must be durable and remain readable throughout the normal life of a garment. Items that do not require care labels include footwear, headwear, gloves, hosiery, items that are disposable, decorative or ornamental items, and sheer items. Additional information on the 1972 Care Labeling Act is included in Chapter Six.

Textile Fiber Products Identification Act – The ***Textile Fiber Products Identification Act***, passed in 1960 and amended subsequently, requires that each textile product carry a label listing the generic names of the fibers from which it is made. The generic fiber categories are established by the Federal Trade Commission which can add new generic categories as needed.

The listing of fibers must be in order of the percentage by weight of fibers present in the product. The fiber present in the largest amount is listed first followed in decreasing amounts by other fibers present. Fiber quantities of less than 5 percent must be labeled as "other fibers" unless they serve a specific purpose in the product. When fibers cannot be identified, their presence must be listed as "X percent of undetermined fiber content."

The law prohibits the use of misleading names that imply the presence of fibers not in a product. Labels must carry either the name, trademark, or registered identification number of the manufacturer. All items covered under the law must be clearly and visibly labeled as to whether they are imported or produced in the United States.

Wool Products Labeling Act – The ***Wool Products Labeling Act***, passed in 1939, regulates the labeling of sheep's wool and other animal hair fibers. The Wool Products Labeling Act requires that all wool products be labeled and the fibers, except for ornamentation, be identified as either new or recycled wool. This act ensures the customer that he or she is purchasing a quality wool garment rather than a garment that resembles wool.

The law also states that the percentage of wool used in the face and the percentage of wool used in the backing of pile fabrics must be printed on the label. The contents of paddings, linings, and stuffings are listed separately from the face fabric content of products but must be listed on the same label. The origin of the wool (imported or domestic) must also be clearly printed on the label. Additional information on the Wool Products Labeling Act is included in Chapter Six.

Fur Products Labeling Act – The ***Fur Products Labeling Act***, passed in 1951, protects consumers from deceptive information on fur product labels and advertisements. The act requires the label of a fur product to list the name of the animal that produced the fur. In addition, information must be provided informing the customer if the fur has been bleached, dyed, or artificially colored in any other way. This act assures the customer that she or he is not purchasing a garment made from undesirable fur and sold under the name of higher quality fur.

The Fur Products Labeling Act also requires labels to contain information on the type of fur that is used in a garment, such as waste fur; fur from the ears, throats, paws, tails, or bellies of animals; and scrap pieces. The act also requires labels to list the country of origin of imported furs. The Fur Products Labeling Act requires that all fur products be labeled, even garments containing only a fur trim.

Flammable Fabrics Act – The ***Flammable Fabrics Act***, enacted in 1953, prohibits the sale of fabrics that burn faster, easier, and more intensely than other fabrics. The Flammable Fabrics Act resulted in the development of standards for flame-retardant children's sleepwear and apparel. The act also resulted in flame-retardant household textile products such as mattresses, rugs, and upholstery fabrics. Enactment of the Flammable Fabrics Act has led to the development of new fibers and finishes for production of flame-resistant fabrics.

Consumer Rights and Responsibilities

Customers have certain rights and privileges when making purchases. To make quality purchases, individuals should be aware of these rights and act responsibly. In 1962, President John F. Kennedy defined the rights of consumers. President Richard Nixon and President Gerald Ford each added one consumer right to the list. This list of consumer rights is referred to as the ***Consumer Bill of Rights***. These consumer rights have resulted in the passage of many apparel and textile laws such as the ones discussed in this chapter.

Employees are not responsible when customers make poor buying decisions. It is important, however, for employees to understand the rights of customers. Knowing that a customer has certain rights and being aware of those rights can enhance the customer/store relationship.

Consumer rights are accompanied by consumer responsibilities. In order to exercise their rights, customers should make an effort to act responsibly when shopping. For example, consumers have the right to be informed, but they also have the responsibility of analyzing the information they are given. Examples of consumer rights and responsibilities are included in table 15.3.

Consumer Agencies

Consumer agencies are organizations that enforce consumer legislation, such as apparel and textile laws, by investigating consumer problems and implementing rules and regulations that govern business activities. Agencies may operate locally, be funded by state and national programs, or be privately owned and operated. Questions, comments, and complaints concerning most consumer products can be directed to organizations such as the following:

- better business bureaus – ***Better business bureaus*** are non-profit organizations sponsored by private, local businesses. The services offered by better business bureaus vary from place to place and often include services such as general information on products or services, reliability reports, background information on local businesses and organizations, and records of companies' complaint handling performances. Many better business bureaus accept written complaints and will contact a firm on the behalf of the consumer.
- industry consumer programs – ***Industry consumer programs*** are programs in which industry associations assist consumers with problems related to a specific industry. These associations are formed by individual businesses which join to assist with business problems and promote their industry. They usually offer consumer information and some handle complaints. Industry consumer programs include the American Apparel Manufacturers Association, the American Textile Manufacturers' Institute, and the National Association of Hosiery Manufacturers.
- consumer offices – ***Consumer offices*** are familiar with local businesses and laws, and they help consumers resolve problems. There are consumer offices at the state, county, and city levels. When making a complaint, an individual should first contact the office nearest his or her home. It is recommended that complaints be submitted to the consumer office in writing. Consumer offices may be located in governors' offices, state attorney generals' offices, or mayors' offices.
- federal agencies – ***Federal agencies*** are organizations associated with the government of the United States. Some federal agencies handle individual complaints while others take action for the benefit of the public as a whole. Many federal agencies also provide publications, fact sheets, and other helpful consumer information. Federal agencies include the Consumer Information Center, the Consumer Product Safety Commission, the Federal Trade Commission, and the Small Business Administration. Information regarding federal agencies can be obtained by calling the Federal Information Center (FIC).

Consumer Rights	Consumer Responsibilities
The Right to Safety protection from goods and services that are dangerous	**The Responsibility to Use Products Safety** • Use items as they were intended to be used. • Follow recommended care and maintenance procedures. • Examine products for safety features. • Study care instructions before buying and using. • Study product safety ratings.
The Right to Be Informed protection from misleading and false information such as on labels and in advertisements	**The Responsibility to Use Information** • Locate information and compare and evaluate products before purchasing. • Analyze advertisements. • Look for recent developments and information on goods and services. • Understand performance claims. • Check use and care instructions before buying. • Seek information when existing information is inadequate.
The Right to Choose availability of a variety of good and services from which to choose	**The Responsibility to Choose Carefully** • Use buying power intelligently to encourage ethical business practices and reliable, safe products. • Be selective and resist pressure. • Recognize resource limitations. • Refuse products that waste resources. • Compare products before making purchases.
The Right to Be Heard right to speak out and be heard; assurance that interests can be expressed in legislative and judicial proceedings	**The Responsibility to Speak Out** • Express complaints and satisfactions through proper channels. • Suggest consumer legislation. • Suggest product improvements. • Know where to seek help. • Write to congressional representatives.
The Right to Redress assurance that problems will be corrected	**The Responsibility to Seek Redress** • Follow-up on problems until desired results are achieved. • Explain problems carefully and briefly. • State solutions to problems. • List the steps already taken to solve problems.
The Right to Consumer Education availability of consumer oriented educational resources such as reading material, classes, and seminars	**The Responsibility to Be an Educated Consumer** • Take advantage of consumer education classes and seminars. • Subscribe to and read consumer education related magazines. • Become informed on current consumer legislation.

Table 15.3

Points to Remember

- Apparel and accessory choices are based on personality; lifestyle; desired image and first impression; and values, needs, and wants.
- Employees should be prepared to assist customers in selecting appropriate levels of quality.
- Factors that influence the quality of apparel and accessories include appearance, care, comfort, and durability.
- Apparel and textile laws encourage higher quality apparel and accessories and promote product safety, reliable service, and honest advertising.
- Apparel and textile laws include the 1972 Care Labeling Act, the Textile Fiber Products Identification Act, the Wool Products Labeling Act, the Fur Products Labeling Act, and the Flammable Fabrics Act.
- Individuals as well as employees should be aware of the rights and responsibilities of consumers and how they affect the quality of apparel and accessories.
- Consumer agencies such as better business bureaus, industry consumer programs, consumer offices, and federal agencies enforce consumer legislation by investigating consumer problems and governing business activities.

Words to Know

accessories
appearance
better business bureaus
care
comfort
consumer agencies
consumer offices
Consumer Bill of Rights
detachable labels
durability
federal agencies
first impression
Flammable Fabrics Act
Fur Products Labeling Act
hangtag
high quality
image
industry consumer programs
label
lifestyle
low quality
medium quality
minimum care
needs
1972 Care Labeling Act
permanent labels
personality
quality
Textile Fiber Products Identification Act
values
wants
Wool Products Labeling Act

Questions for Review

1. How do image, first impression, personality, and lifestyle influence apparel and accessory choices?
2. How do values, needs, and wants affect the quality people desire in apparel and accessories?
3. How can an employee gain information about and assess a customer's values, needs, and wants?
4. What distinguishes high quality, medium quality, and low quality apparel and accessories?

[redacted]

5. Why is the price of an item not always an accurate indication of the level of quality?

6. How do appearance, care, comfort, and durability affect the quality of apparel and accessories?

7. How is the quality of apparel and accessories affected by legislation?

8. In what ways do labels and hangtags differ?

9. Why is it important for customers and employees to be aware of consumer rights and responsibilities?

10. Why must individuals act responsibly when exercising their consumer rights?

11. What role do consumer agencies play in improving the quality of apparel and accessories?

16

Coordinating Apparel and Accessories

ESSENTIAL ELEMENT

- Illustrate coordination of clothing and accessories for infants, children, or adults.(q6C)

OBJECTIVES TO ACHIEVE

- Identify basic styles of clothing for infants and toddlers.
- Compare basic styles of women's blouses, skirts, and dresses and determine how they affect the coordination of apparel.
- Analyze basic styles of women's coats and jackets and determine how they affect the coordination of apparel.
- Distinguish basic styles of menswear and determine how they affect the coordination of apparel.
- Outline factors to consider when coordinating apparel and accessories.

Employees in the textiles and apparel industries must often assist customers in coordinating apparel and accessories. Salespersons in retail stores often help customers combine apparel and choose accessories. Salespersons in fabric stores and departments may assist customers in selecting coordinating fabrics and notions. Personal shoppers select and coordinate wardrobes for customers. Image consultants assist clients in assessing their wardrobes and making apparel and accessory selections.

In order to coordinate apparel and accessories effectively, it is necessary for employees to become familiar with factors such as uses of fabrics, combination of patterns, methods for matching colors, and complementary design features and styles. In addition, employees should be familiar with various clothing styles and types of apparel and accessories available for infants and children, women, and men.

APPAREL FOR INFANTS AND TODDLERS

Employees who sell apparel for infants and toddlers often assist parents, friends, and relatives in selecting clothing for children of different sizes and ages. Employees should assist customers in making selections that are durable, well-proportioned, and comfortable for children. To adequately assist customers, employees should understand the needs and the growth patterns of children and have a knowledge of the merchandise available.

Many children do not enjoy shopping for apparel and accessories. Therefore, employees should show sincere interest in children and attempt to make the shopping experience fun for both parents and children.

Some customers know what type of children's merchandise they want to purchase. These customers may tell a salesperson what items they want. Other customers, however, do not know what type of clothing is appropriate for children. When dealing with these customers, employees may need to ask questions to determine the customers' needs. Employees should attempt to find out each child's weight and measurements so the correct size can be selected.

A child's skin tone and features also should be taken into consideration when choosing apparel and accessories. A salesperson should determine which colors enhance a child's natural skin tone and which styles emphasize a child's desirable features and minimize undesirable features. Once needs are determined, employees can recommend appropriate apparel and accessories.

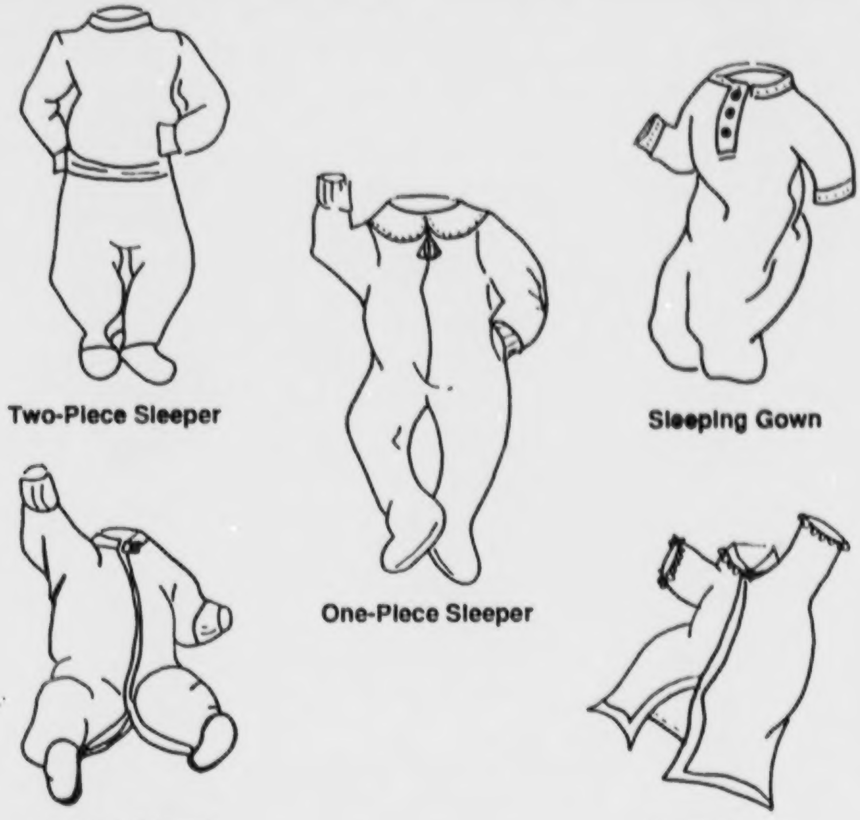
Infants

Customers often find it difficult to purchase clothing for infants. Employees may assist a customer in determining what an infant needs, how long the infant will be able to wear specific items, and the correct size. Employees are often asked to assist customers in choosing a layette. A ***layette*** is a complete outfit for a newborn baby. A layette often consists of apparel, accessories, and bedding.

The main apparel items worn by infants include diapers, shirts, and sleepers. Examples of apparel for infants are included in figure 16.1. A variety of diapers are available for infants. Diapers are made of cloth or disposable materials. Some diapers are prefolded while others may resemble pants. Shirts are designed to keep infants warm. Shirts usually slip on or have snaps. Shirts with snaps open down the front and are convenient since they do not have to be pulled over a baby's head. Shirts may be worn alone or under other clothing.

Since newborn babies sleep a great deal, they are frequently dressed in sleepwear. Sleepwear keeps babies warm while they are sleeping. Infant sleepwear includes a variety of styles such as the following:

- sleepers – A ***sleeper*** is a one-piece suit that covers a baby's feet. Sleepers are usually made of a stretch fabric and have raglan sleeves and snaps down the front, crotch, and legs for easy dressing.
- sleeping gowns – A ***sleeping gown*** is a one-piece gown that has a drawstring bottom to enclose a baby's legs and feet. Sleeping gowns also have sleeves and may include cuffs that can be used to cover a baby's hands.
- kimonos – A ***kimono*** is similar to a sleeping gown. However, kimonos, have closures at the neck and are open at the bottom around the feet.
- two-piece sleepers – A ***two-piece sleeper*** consists of a pullover top and bottoms that snap together at the waist and sometimes down the crotch and legs.



Two-Piece Sleeper

Sleeping Gown

One-Piece Sleeper

Blanket Sleeper

Kimono

Figure 16.1

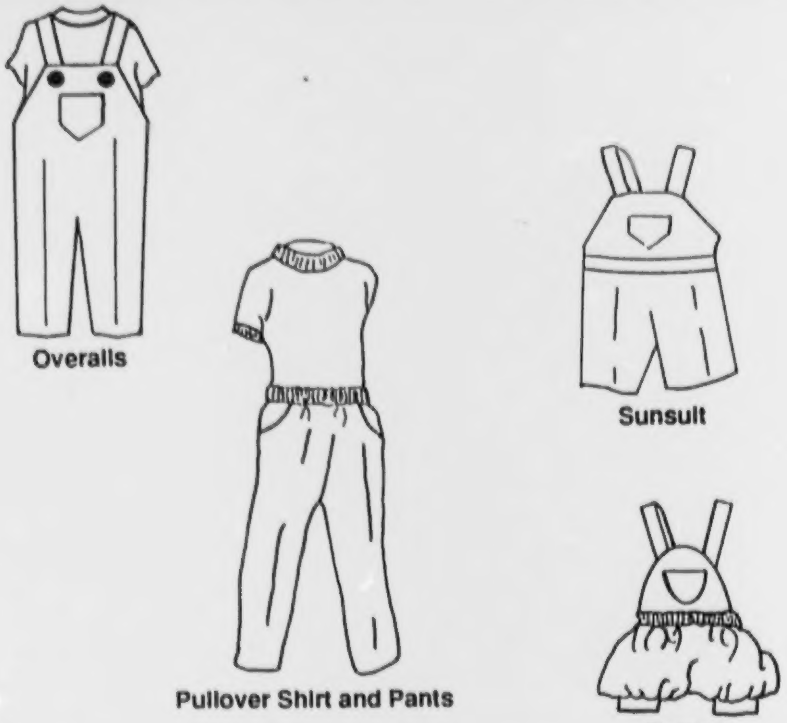
Toddlers

Since toddlers have different needs than infants, their clothing differs from infants' clothing. Toddlers' clothing is unique because it is designed to provide maximum movement and freedom needed by toddlers. Toddlers are learning to walk and are being toilet trained. Therefore, their clothing should not be baggy, and it should be easy to put on and remove.

A wider variety of clothing is available to toddlers than to infants. Clothing for toddlers includes the following:

- training pants rather than diapers
- undershirts for warmth
- sleepers with gripper feet
- pants with elasticized waists
- pullover shirts
- overalls with adjustable suspenders or adjustable straps that button on the waist
- sunsuits
- rompers
- dresses (for girls)
- pants and jacket (for boys)

Figure 16.2 includes examples of clothing appropriate for toddlers.



Overalls

Pullover Shirt and Pants

Sunsuit

Romper

Figure 16.2

WOMEN'S APPAREL

Even though women's fashion styles continually change, there are basic garment styles and parts that remain the same. To effectively coordinate women's apparel and accessories, employees must be familiar with basic garment styles and parts. Garments such as blouses, skirts, dresses, and coats may be modified, but they usually retain elements of basic styles.

Blouses

A ***blouse*** is a loose garment worn on the upper part of the body. Blouses, which are similar to shirts, are worn by women and children. The style of a blouse is usually characterized by particular features of the blouse such as the sleeve, neckline, and/or collar.

Sleeves – Sleeves are usually set-in, kimono, or raglan and range in length from short to wrist length. Set-in sleeves are very common. ***Set-in sleeves*** are joined to a garment at the armhole. Therefore, all garments with set-in sleeves have a seam around the armhole (armseye seam). When constructed correctly, set-in sleeves allow for free arm movement. Set-in sleeves are constructed in a variety of styles. Examples of set-in sleeves are shown in figure 16.3.

Raglan sleeves are attached to the bodice by a seam that continues in one piece to the collar. Raglan sleeves do not have seams at the shoulder. The seam of a raglan sleeve may extend to the neckline, or it may form a design on the bodice. Figure 16.4 illustrates examples of raglan sleeves.

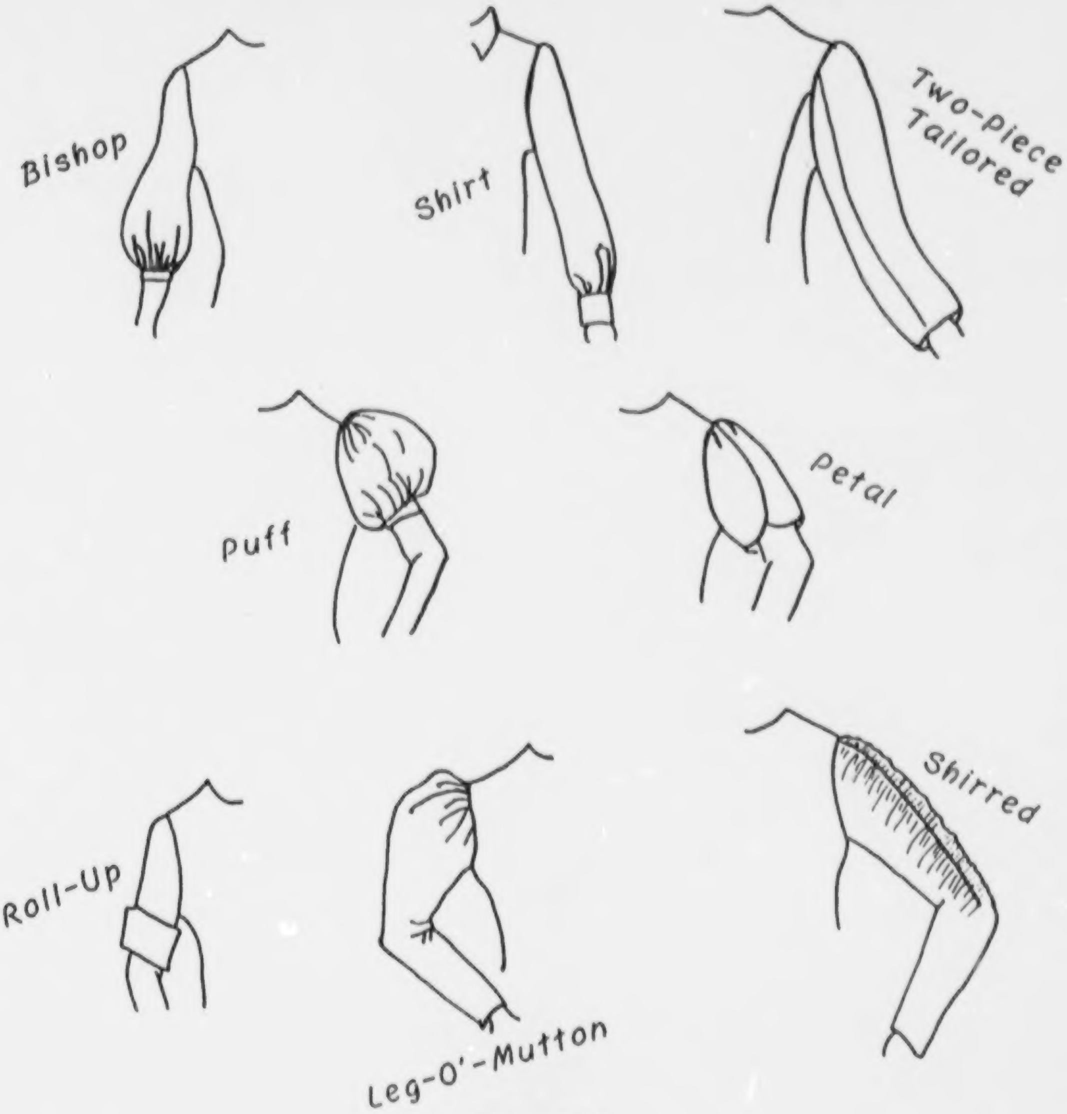


Figure 16.3

Kimono sleeves do not have seams to connect them to the bodice. The bodice and the kimono sleeve are cut in one piece during construction. Some kimono sleeves may have a diamond-shaped piece of fabric called a gusset added to the underarm to provide freer movement. Variations in the kimono sleeve include the dolman sleeve and the batwing sleeve. A ***dolman sleeve*** is a kimono sleeve that is lower than usual at the underarm. A ***batwing sleeve*** is loose and very low at the underarm. Figure 16.5 shows examples of kimono sleeves.

Collars – A ***collar*** is a piece of fabric attached to the neckline of a garment. A collar serves as a frame for the face and directs attention toward the face. Collars may be narrow or wide and may stand up around the neck or lie flat on a garment. Collars come in a variety of styles including those illustrated in figure 16.6.

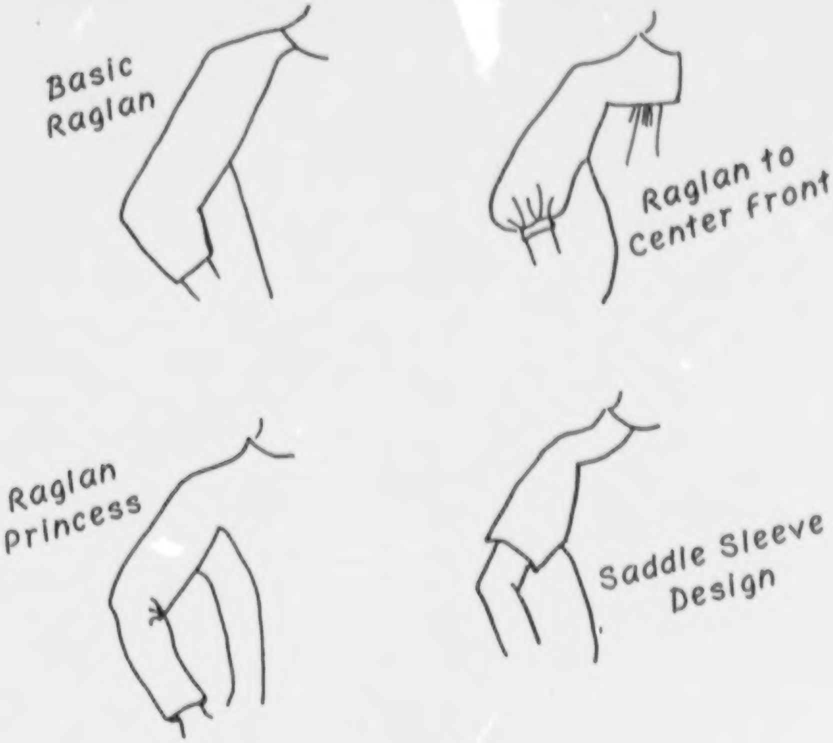


Figure 16.4

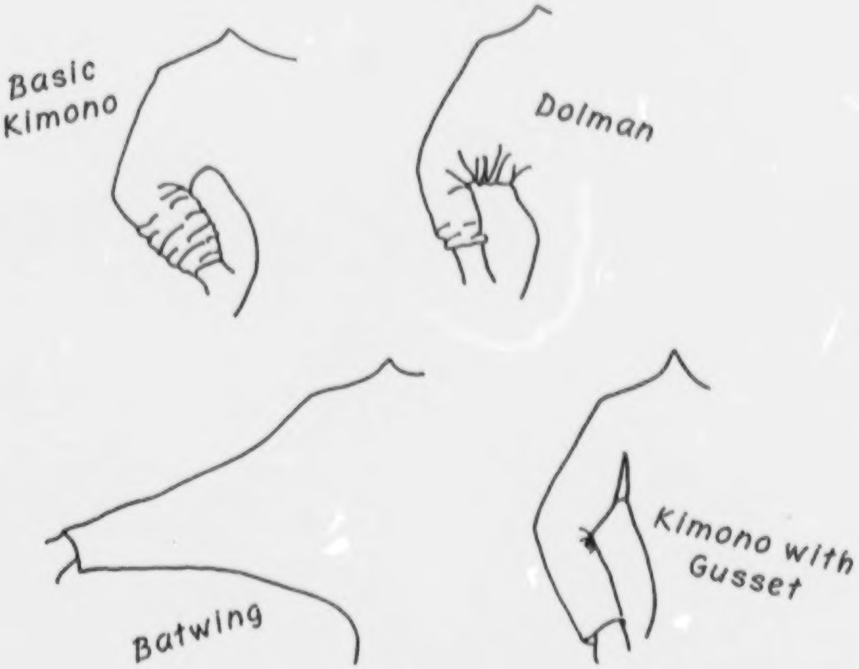


Figure 16.5

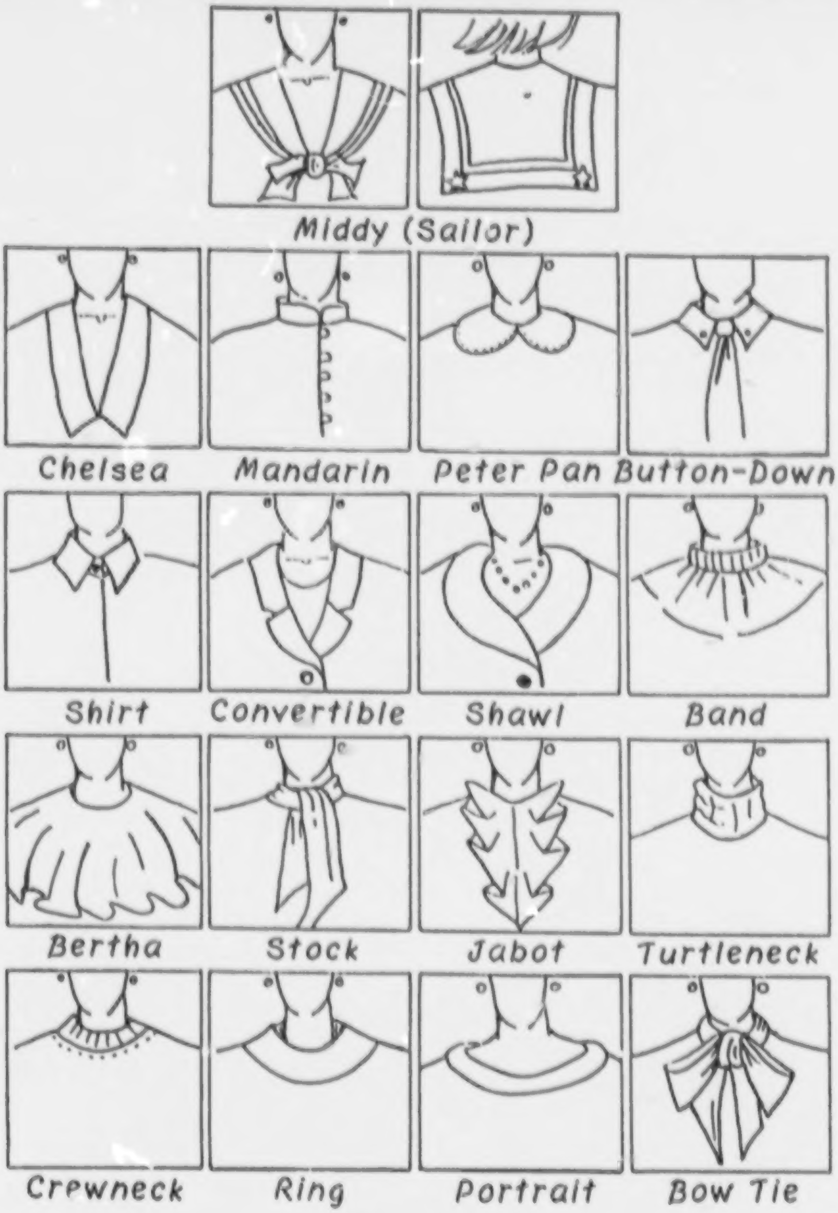


Figure 16.6

Necklines – A ***neckline*** is the line formed around or near the neck by the edge of a garment. It is not necessary for a neckline to be finished by a collar. There are a variety of neckline shapes and variations including the following:

- high in the back and low in the front
- high in the front and low in the back
- low in the front and the back
- high in the front and the back
- off the shoulder
- shaped (such as square and round)

Figure 16.7 contains examples of neckline styles.

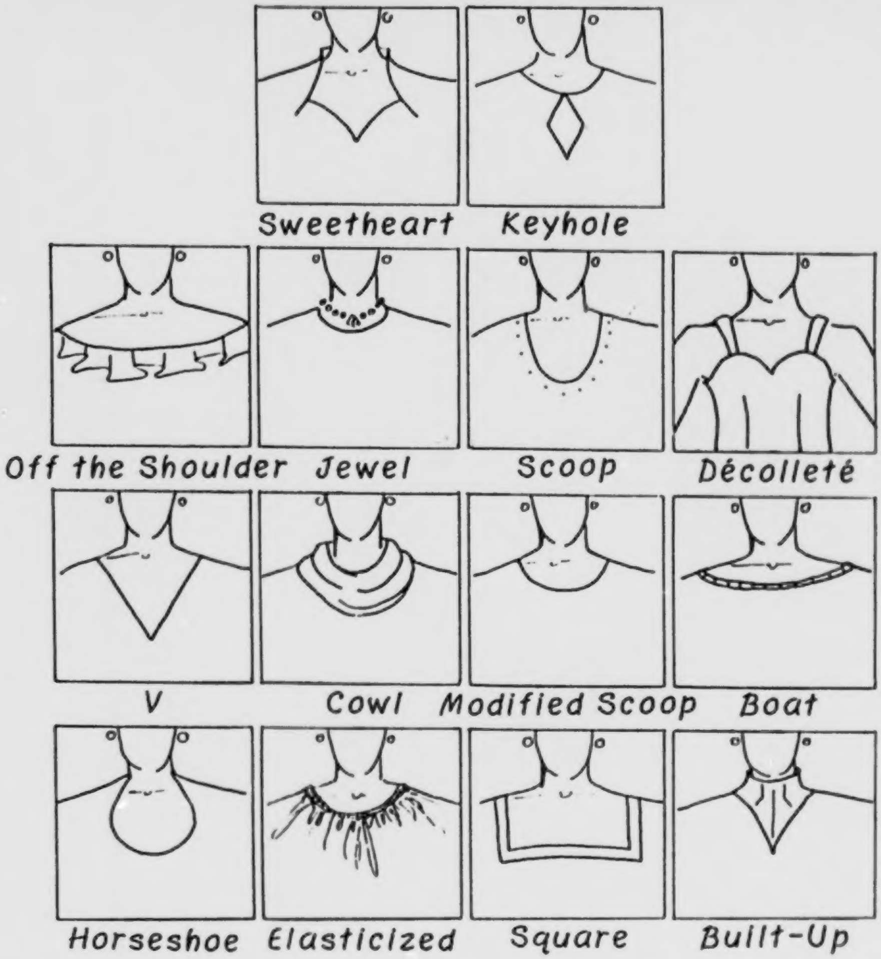


Figure 16.7

Skirts

A ***skirt*** is a garment that hangs down from the waist. Skirts come in a variety of lengths ranging from micro mini (very short) to floor length. Women's skirt styles include the following:

- ***A-line skirt*** – fits close at the waist and flares at the hem
- ***circular skirt***– is full at the hem and forms a circle when laid flat
- ***dirndl skirt*** – is reasonably straight with a gathered waist and some fullness in the skirt
- ***flared skirt*** – spreads outward toward the hem
- ***gathered skirt*** – is full at the waist
- ***gored skirt*** – has vertical seams extending from the waistline down to the hem
- ***pleated skirt*** – has folds of fabric extending from the waistline down to the hem
- ***straight skirt*** or ***fitted skirt*** – contains no added fullness and is straight from the waistline to the hem
- ***wrap skirt*** – wraps around the body and is secured by a tie or button

Figure 16.8 includes examples of women's skirts.

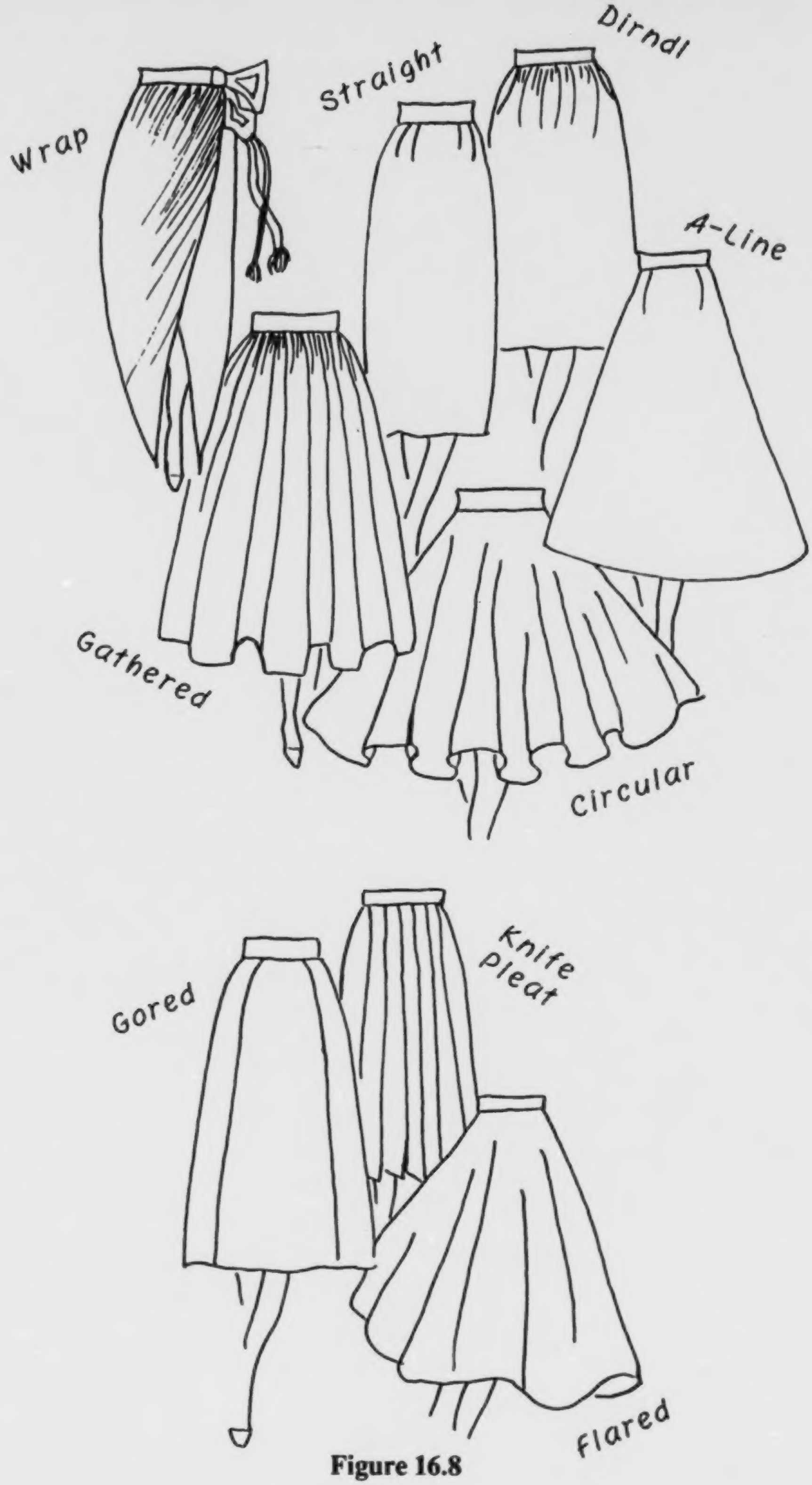

Wrap
Straight
Dirndl
A-Line
Gathered
Circular
Gored
Knife pleat
Flared

Figure 16.8

Dresses

A ***dress*** is a woman's one-piece garment with a bodice and skirt. Women's dresses are available in a variety of basic styles and can range in length from micro mini (very short) to floor length. Women's dresses include the following basic styles:

- ***A-line dress*** – is fitted at the shoulders, has no waistline seam, and flares toward the hem
- ***blouson dress*** – has fullness above the waist, is belted, and has a fitted skirt
- ***coat dress*** – closes down the front and resembles a coat
- ***empire dress*** – has a high waistline and short torso
- ***lowered waistline dress*** – has a low waistline and a long torso
- ***princess dress*** – has vertical seams extending from the shoulder or armhole to the hem and is closefitting
- ***sheath dress*** – has no waistline seam and is shaped inward at the waist
- ***shift dress*** or ***chemise dress*** – has no waistline seam, fits loosely, and is not shaped inward at the waist
- ***shirtwaist dress*** – has a belt at the waist and resembles a long, tailored shirt
- ***tent dress*** – is large and flows loosely from the shoulders

Examples of women's dresses are shown in figure 16.9.

Coats and Jackets

A ***coat*** is a sleeved garment that opens down the front and provides warmth and/or protection. Coats are worn over one's clothing. The style of women's coats may be dressy or casual. Coats are often intended to be worn during a specific season such as winter or spring. Winter coats are usually made of a heavier fabric than spring coats.

Women's coat styles include the following:

- ***balmacaan coat*** – a loose coat with raglan sleeves
- ***capecoat*** or ***Inverness cloak*** – a coat with a cape over the sleeves
- ***chesterfield coat*** – a single-breasted coat that usually has a fly front and a velvet collar
- ***princess coat*** – a closefitting coat with a flared skirt
- ***trench coat*** – a military style, belted raincoat that usually has shoulder straps
- ***wrap coat*** – a coat that wraps around the body and is secured by a belt

Examples of these coat styles are illustrated in figure 16.10

A ***jacket*** is a shorter version of a coat. Jackets differ from coats in that jackets are often worn to complement apparel rather than to provide warmth and protection. The style of women's jackets may be dressy or casual and heavy or lightweight. Types of jacket styles include the following:

- ***bolero jacket*** – a waist-length jacket that is open at the front
- ***box jacket*** – a loosefitting jacket that hangs straight from the shoulders
- ***Chanel jacket*** – a single-breasted, collarless jacket usually having trim around the neckline, front, and lower edge
- ***Norfolk jacket*** – a single-breasted, loosefitting jacket with a belt, a pocket on each side, and box pleats on the front and back
- ***pea jacket*** – a double-breasted, hip-length coat constructed of heavy woolen fabric
- ***safari jacket*** – a belted jacket with two pleated pockets both above and below the belt
- ***Windbreaker*** – a jacket with an elastic waistband and cuffs

Illustrations of these jacket styles are shown in figure 16.11.

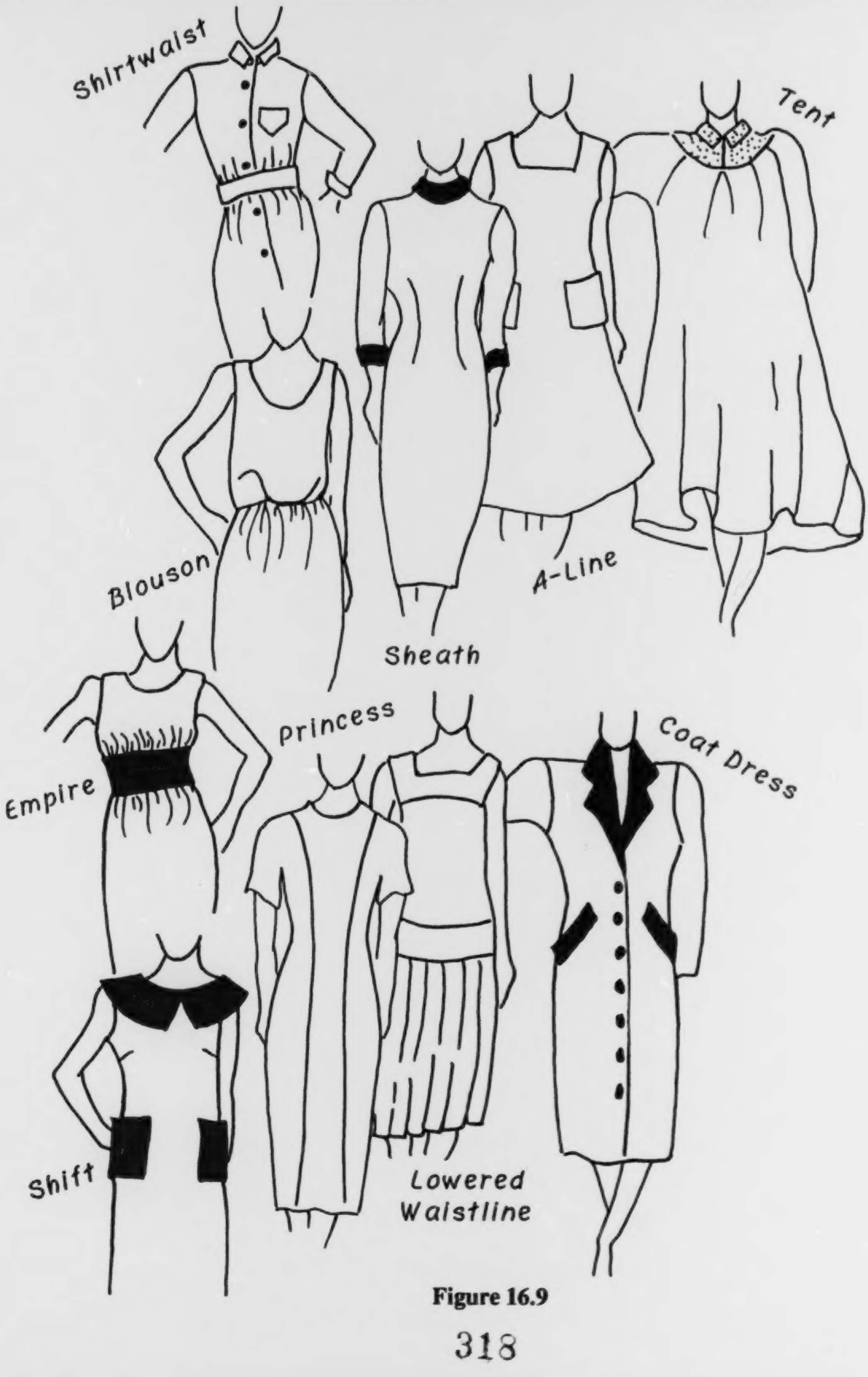

Shirtwaist
Tent
Blouson
A-Line
Sheath
Princess
Coat Dress
Empire
Shift
Lowered Waistline

Figure 16.9

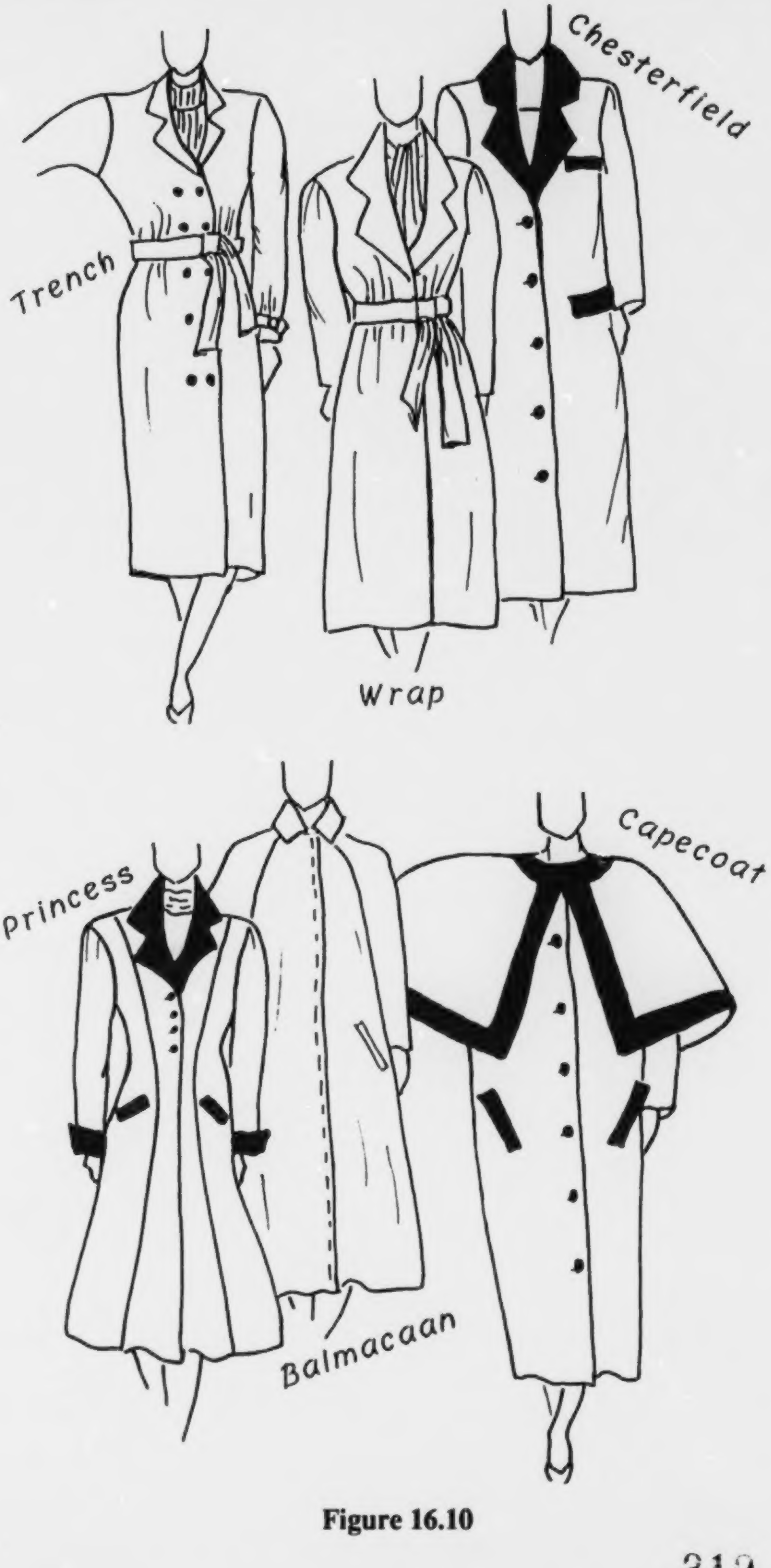


Figure 16.10

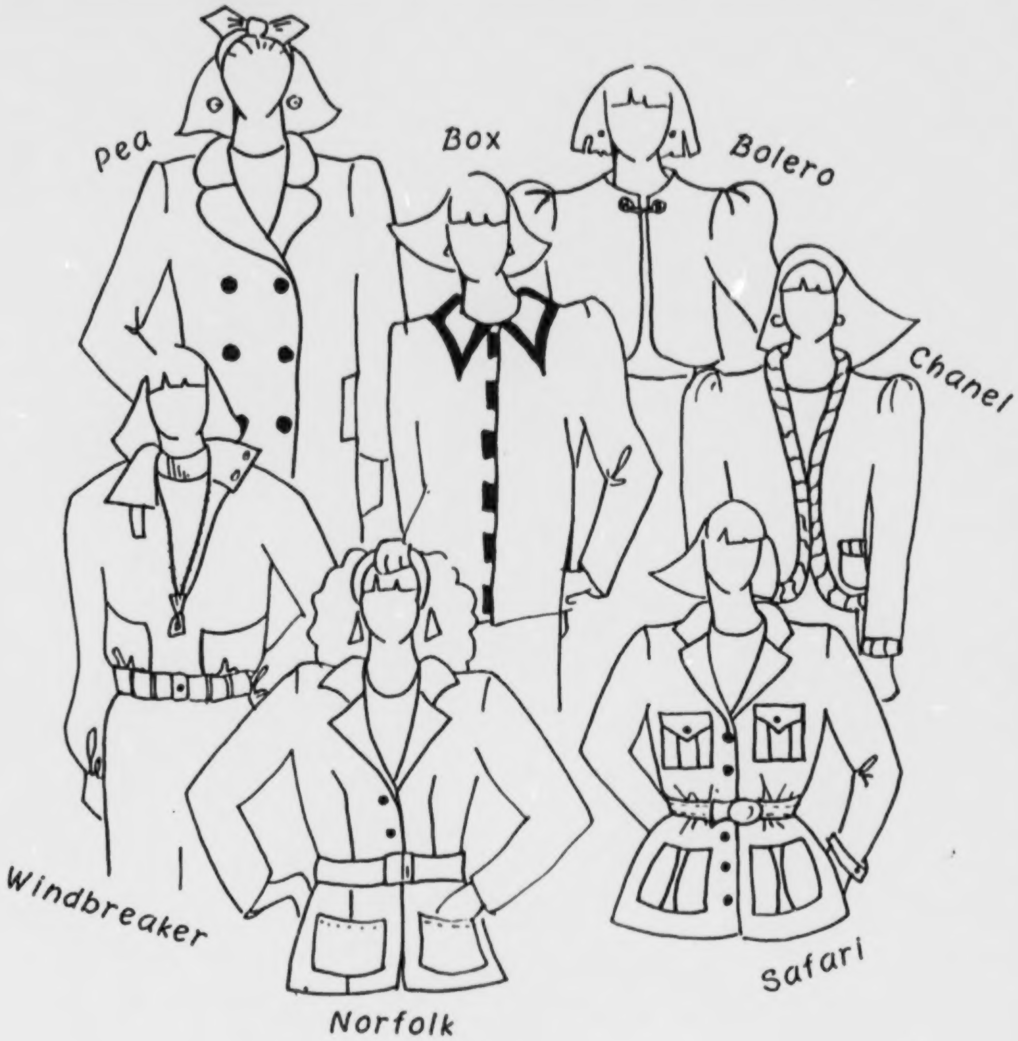


Figure 16.11

MEN'S APPAREL

Employees should have a thorough understanding of the basic styles of menswear in order to effectively assist customers in coordinating apparel and accessories. Basic menswear items, such as shirts, are often modified to achieve a different look. However, menswear items can usually be identified according to basic styles. Men's apparel items easily identified by a particular style include suits, jackets, pants, shirts, and coats.

Suits, Jackets, and Pants

A ***suit*** is a set of garments intended to be worn together, such as jacket and pants. Men's suits are available in two-piece or three-piece styles. A ***two-piece suit*** consists of a jacket and pants. A ***three-piece suit*** consists of a jacket, pants, and a vest.

Men's suits may be American cut or European cut. The ***American cut*** suit has natural sloping shoulders, a loosefitting jacket, and moderately wide-notched lapels. The ***European cut*** suit has padded shoulders, tighter armholes, a jacket narrowed at the waist, and peaked lapels. Both styles may be single-breasted or double-breasted. Examples of the American cut and the European cut are shown in figure 16.12.

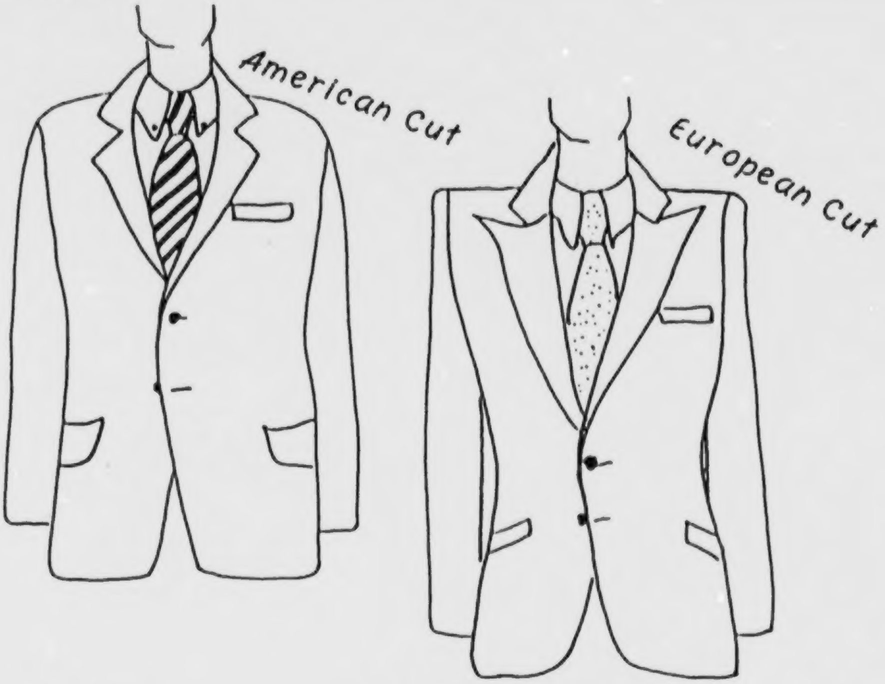
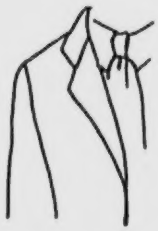


Figure 16.12

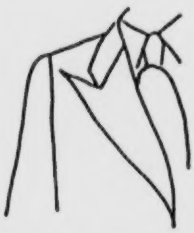
Jackets – A ***single-breasted*** suit has a jacket that overlaps the front of the body and is fastened by a single row of buttons or one button. A ***double-breasted*** suit has a jacket that overlaps the front of the body to provide a double thickness of material across the chest. Double-breasted jackets are fastened by a double row of buttons. Figure 16.13 includes examples of single-breasted and double-breasted jackets.

A ***sports jacket*** is a jacket that is more casual than a jacket worn with a suit. Sports jackets are usually worn with casual pants. Sports jackets have full shoulders, straight lines, and are loosefitting. In addition, they may have patch pockets. Two common types of sports jackets are the blazer and the single-breasted tweed jacket. A ***blazer*** is a lightweight, single-breasted sports jacket. Blazers are available in a variety of colors such as navy blue, kelly green, and red, and they often have silver or gold buttons.

The style of a jacket may be determined by the type of lapel. A ***lapel*** is the part of a jacket that folds back on the chest and forms a continuation of the collar. Two common types of lapels are the notch lapel and the peak lapel. The ***notch lapel*** is a standard business lapel. The notch lapel has a v-shaped indent where the collar meets the lapel. The ***peak lapel*** consists of two sharp points and it is more formal than the notch lapel. Peaked lapels are often included on double-breasted jackets.



Notch Lapel



Peak Lapel

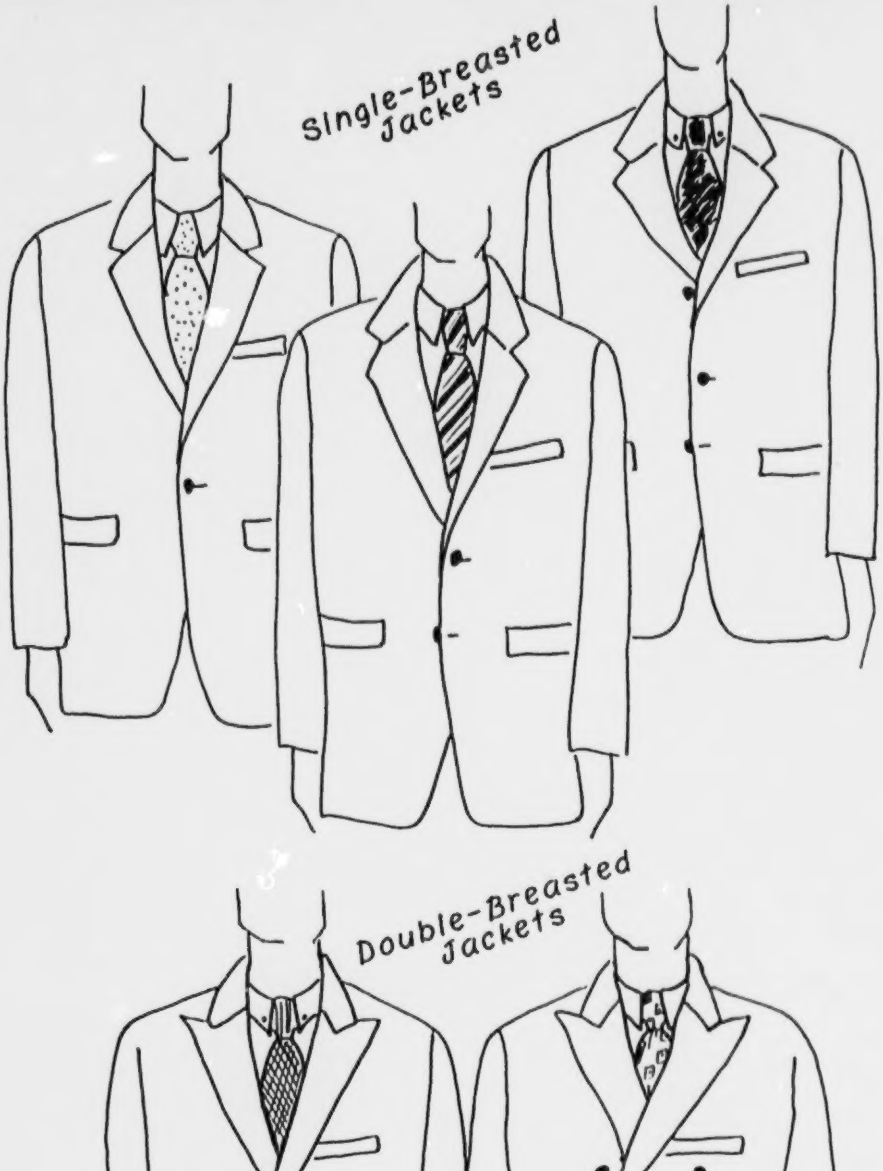


Figure 16.13

Pants – ***Trousers*** are pants worn with a suit. Trousers are not usually worn for casual occasions. The details of trousers vary and may include a plain or pleated front, full-cut or slim-cut lines, tapered legs, self-waistband, extended waistband, or separate waistband. A ***self-waistband*** does not have belt loops and is designed to be worn without a belt. An ***extended waistband*** may be worn with or without a belt. A ***separate waistband*** has belt loops and is designed to be worn with a belt.

Slacks are pants that are often worn for casual occasions. Slacks may be traditional or continental style. ***Traditional slacks*** have belt loops and a waistband that is separately sewn. ***Continental slacks*** have a split waistband and no belt loops and often can be adjusted on the side of the waist.

Shirts

Men's shirts may be classified as work shirts, sport shirts, or dress shirts. A ***work shirt*** is intended to be worn when performing work requiring physical activity. A ***sport shirt*** is casual and is often made of knitted or woven materials. Sports shirts are often worn with slacks or jeans. A ***dress shirt*** is more formal and is intended to be worn with a suit.

Dress shirts may be identified by the style of the front of the shirt. Shirt front styles include the French front and box center pleat. The ***French front*** has a plain, neat front facing. Extra material is stitched to the underside of the front piece to form the French front. The ***box center pleat*** has extra material stitched separately on top of the shirt front in a single line. The box center pleat is a more traditional style. Figure 16.14 shows examples of shirt front styles.

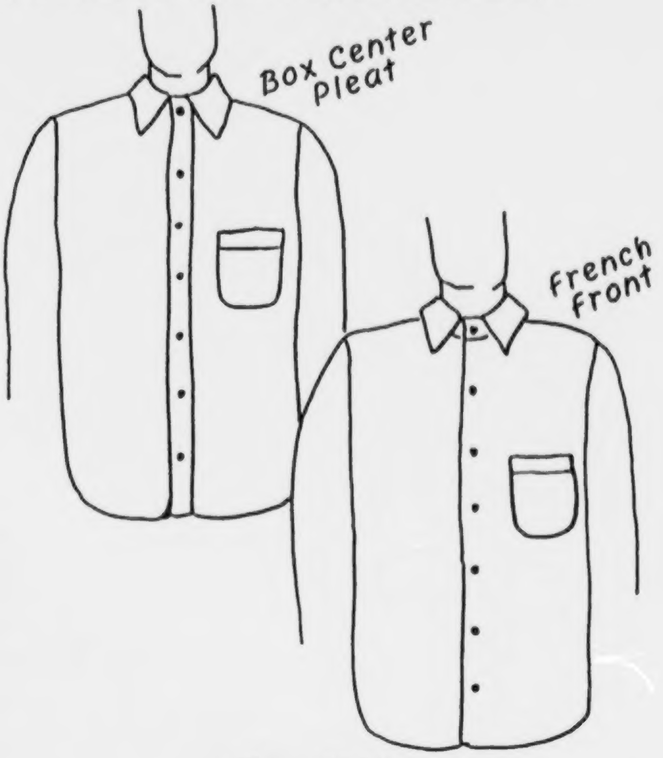


Figure 16.14

The style of a dress shirt is also influenced by features such as collar style and cuff style. Common styles of dress shirt collars include the following:

- ***button-down collar*** – buttons to the body of the shirt and has a soft, roll effect
- ***French-style collar*** – has short points and a large spread (the space between the tips of the collar)
- ***long-point collar*** – has a small spread and is 4" to 4 1/2" in length
- ***standard collar*** – is about 3" in length and is versatile
- ***tab collar*** – has snap tabs or a collar pin to hold the collar tips behind the tie knot

Figure 16.15 shows examples of these collar styles.

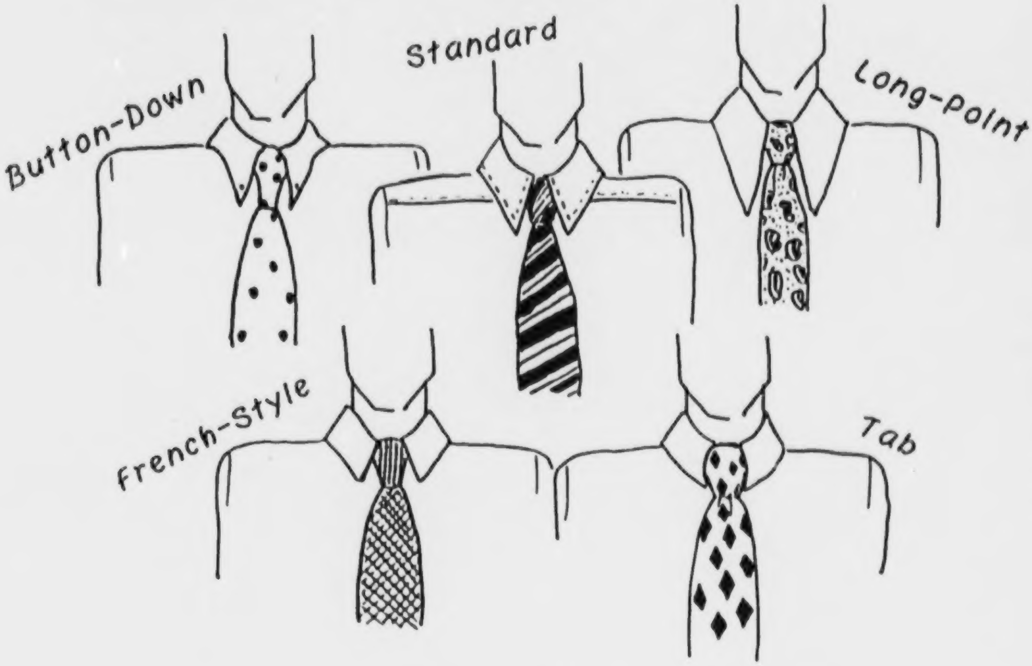
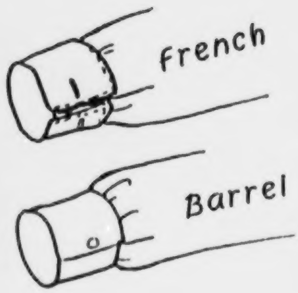


Figure 16.15



Common styles of cuffs include the barrel cuff and the French cuff. The ***barrel cuff*** is a traditional style of cuff that buttons. The ***French cuff*** is folded back and secured by cuff links rather than buttons.

Coats

A coat is worn over men's clothing to provide warmth and/or protection. Types of men's coats include the following:

- ***topcoat*** – lightweight, full-length coat generally worn during the fall and spring
- ***overcoat*** – heavy, full-length coat generally worn during cold weather
- ***all-weather coat*** – water-repellent coat with a zip-out lining so it can be worn during any season
- ***three-quarter length coat*** – shorter coat that is considered more casual

Men's coats are available in single-breasted and double-breasted styles with or without belts. Basic styles of men's coats include the following:

- ***balmacaan coat*** – a single-breasted coat with full, raglan sleeves

- ***chesterfield coat*** – a single-breasted or double-breasted coat that usually has a fly front and sometimes a velvet collar
- ***trench coat*** – a military style belted raincoat that usually has shoulder straps
- ***ulster coat*** – a loose, heavy, long coat sometimes having a belt
- ***wrap coat*** – a coat that wraps around the body and is secured by a belt

Figure 16.16 shows examples of men's coats.

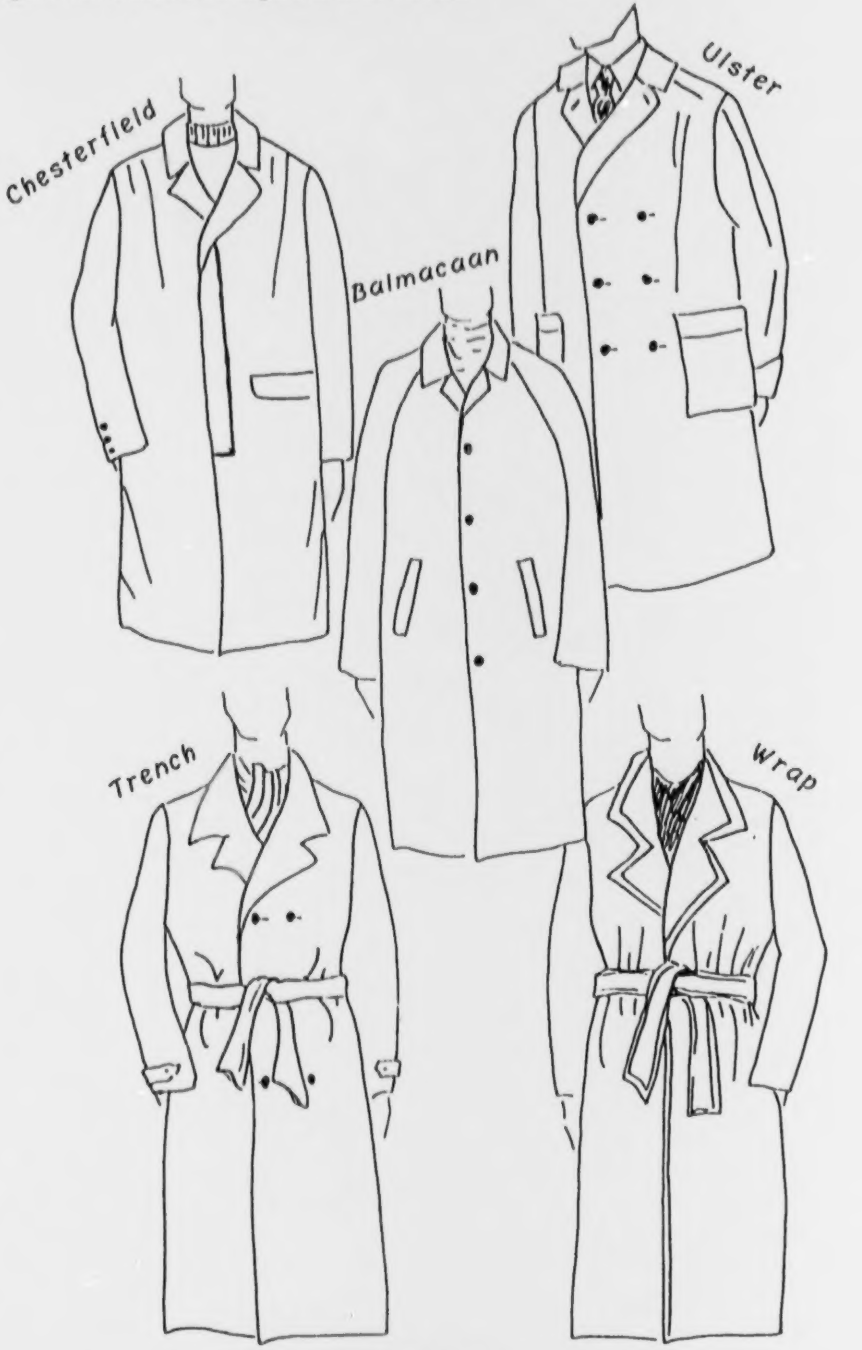


Figure 16.16

COORDINATING APPAREL AND ACCESSORIES

The term ***coordinate*** refers to the combining of apparel and accessories to form a pleasing ensemble when worn together. In order to help customers choose apparel and accessories that complete an attractive outfit, employees should have an understanding of the various factors that affect the coordination of clothing. The elements and principles of design and the weight and hand of fabric all influence the coordination of apparel and accessories.

The elements and principles of design are the guidelines that are followed when coordinating apparel and accessories. As discussed in Chapter Eight, the elements of design include line, shape or form, space, texture, and color. The principles of design include balance, proportion, rhythm, emphasis, and harmony or unity.

Factors to Consider When Coordinating Apparel

Color – Color is usually the most obvious factor that is considered when coordinating apparel. Employees should be familiar with the color wheel and different color schemes to assist customers in coordinating attractive wardrobes. Basic color schemes include monochromatic, analogous, complementary, split complementary, double complementary, triad, and accented neutral.

When choosing color schemes, employees should understand the properties of colors and how they affect the appearance of apparel. Hue, value, tint, shade, and intensity all affect the appearance of color and must be considered when combining colors. More detailed information on color and color schemes is included in Chapter Eight.

An additional aspect to consider when assisting customers in coordinating colors is skin tone. Some individuals have skin with cool undertones while others have skin with warm undertones. Individuals whose skin has cool undertones look attractive in cool colors such as blue, green, and purple. Individuals whose skin has warm undertones look attractive in warm colors such as red, yellow, and orange. Individuals who have had their colors analyzed by a professional color consultant or image consultant will know if cool or warm colors look best on them, but they may need help in locating apparel of the correct colors.

Texture – Texture is the surface quality of an object. Texture plays an important role in the coordinating of appealing apparel combinations. Apparel items are available in a variety of textures such as rough, smooth, shiny, soft, and harsh. The texture of an item often depends on the method used to construct the fabric. Variations in weaving and knitting can create ridges in fabric or make fabrics smooth, fuzzy, or shiny.

When textures are combined, they should be related or should contrast pleasantly. For example, the texture of shiny taffeta fabric does not complement the texture of rough tweed fabric, and the texture of lightweight cotton pants does not complement the texture of a tweed sports jacket. These textures are not related and do not form a pleasant contrast.

When textures are combined successfully, they express harmony and a pleasing appearance. Employees should practice combining textures and observe textures that coordinate well. Additional information on texture is located in Chapter Eight.

Weight and Hand – As discussed in Chapter Seven, weight is the heaviness or lightness and thinness or thickness of a fabric. Hand is the feel, body, and the way the fabric falls when draped. The weight and hand of fabric affect how well apparel coordinates.

Certain types of garments are generally made of certain weights of fabrics. Fabrics may be lightweight, medium-weight, heavyweight, or very heavyweight. Lightweight fabrics are usually used to construct shirts or blouses, medium-weight fabrics are usually used to construct skirts and slacks, and heavyweight fabrics are usually used to construct winter suits and coats.

When coordinating apparel, employees should consider the weight of different garments and attempt to match items of complementary weights rather than only items of similar weights. For example, a pair of medium-weight wool pants and a wool sweater make an attractive combination as do a lightweight silk blouse and a medium-weight wool skirt. However, a lightweight, casual cotton skirt and a dressy silk blouse do not complement each other.

Factors to Consider When Coordinating Accessories

When accessories are being chosen to complement apparel, they should be analyzed according to various factors such as the intended use of the accessory, the design of the garment and the accessory, and the materials used to construct the accessory. It is important to take these factors into consideration since poor accessory choices can ruin the appearance of an otherwise well-coordinated ensemble.

The intended use of an accessory should be considered to ensure that the accessory complements the intended use of the garment. For example, when some shoes are designed, they are intended to be worn for formal or dressy occasions. Black patent leather shoes with a black bow on the toe are intended to be worn with dressy clothes or on special occasions. These shoes would not complement casual clothing such as jeans. Casual footwear such as athletic shoes is more appropriate to wear with jeans.

A western belt is another example of an accessory with an intended use. A western belt with a large belt buckle is intended to be worn with casual clothes such as jeans. Western belts with large, decorative buckles do not usually complement more formal attire such as a man's suit.

The design of the garment(s) worn also influences the choice of accessories. Accessories should enhance the design of a garment rather than detract from it. For example, a piece of jewelry such as a heavy gold chain might be worn with a scoop neckline while a a lightweight drop necklace or a pendant necklace that forms the shape of a *v* might accentuate a v-neckline.

The type of material an accessory is made of should also be considered when coordinating apparel and accessories. Some materials are considered more casual than others and are usually worn with casual clothing. For example, a necklace made of plastic is considered to be more casual than a diamond necklace. A plastic bead necklace is usually worn with casual garments while an elaborate diamond necklace is worn with dressy clothing or evening wear. In addition, a casual knit necktie coordinates better with a tweed sports jacket than a business suit. A necktie made of silk is usually worn to complement a business suit.

Points to Remember

- When selecting apparel for infants and toddlers, employees should base selections on a child's weight, measurements, skin tone, and features as well as the durability and comfort of garments.
- Basic apparel worn by infants includes diapers, shirts, and sleepers while apparel for toddlers may include training pants, pants with elasticized waists, and pullover shirts.
- The style of a woman's blouse is usually characterized by the style of the sleeves, the style of the collar, and the shape of the neckline.
- Women's skirts are available in a variety of styles including A-line, circular, dirndl, flared, gathered, gored, pleated, straight or fitted, and wrap.
- Basic styles of women's dresses include the A-line, blouson, coat, empire, lowered waistline, princess, sheath, shift or chemise, shirtwaist, and tent.
- Women's coats (such as the balmacaan, capecoat, chesterfield, princess, trench, and wrap) are worn over clothing to provide warmth and/or protection while jackets (such as the bolero, box, Chanel, Norfolk, pea, safari, and Windbreaker) are often worn to complement apparel.
- Types of men's jackets include single-breasted jackets, double-breasted jackets, sports jackets, and blazers while men's pants include trousers and slacks.
- The style of a man's dress shirt is often characterized by the style of the shirt front, the collar, and the cuffs.
- Types of men's coats include the topcoat, overcoat, all-weather coat, and three-quarter length coat. These coats are often available in basic styles such as the balmacaan, chesterfield, trench, ulster, and wrap.
- Factors to consider when coordinating apparel include color schemes, textures of garments, and the weight and hand of fabrics.
- The intended use of accessories, the design of both garments and accessories, and the materials used to construct accessories should all be considered when coordinating accessories with apparel.

Words to Know

A-line dress
A-line skirt
all-weather coat
American cut
balmacaan coat
barrel cuff
batwing sleeve
blazer
blouse
blouson dress
bolero jacket
box center pleat
box jacket
button-down collar
capecoat
Chanel jacket
chemise dress
long-point collar
lowered waistline dress
neckline
Norfolk jacket
notch lapel
overcoat
pea jacket
peak lapel
pleated skirt
princess coat
princess dress
raglan sleeves
safari jacket
self-waistband
separate waistband
set-in sleeves
sheath dress

chesterfield coat
circular skirt
coat
coat dress
collar
continental slacks
coordinate
dirndl skirt
dolman sleeve
double-breasted
dress
dress shirt
empire dress
European cut
extended waistband
fitted skirt
flared skirt
French cuff
French front
French-style collar
gathered skirt
gored skirt
Inverness cloak
jacket
kimono
kimono sleeves
lapel
layette
shift dress
shirtwaist dress
single-breasted
skirt
slacks
sleeper
sleeping gown
sport shirt
sports jacket
standard collar
straight skirt
suit
tab collar
tent dress
three-piece suit
three-quarter length coat
topcoat
traditional slacks
trench coat
trousers
two-piece sleeper
two-piece suit
ulster
Windbreaker
work shirt
wrap coat
wrap skirt

Questions for Review

1. What factors should employees consider when selecting apparel for infants and toddlers?

2. In what ways can an employee assist a customer in selecting apparel for an infant?

3. Why does clothing for toddlers differ from clothing for infants?

4. Why should employees be familiar with basic garment styles and parts?

5. How do set-in sleeves, raglan sleeves, and kimono sleeves differ?

6. What are the main differences in styles of women's skirts?

7. How do basic styles of women's dresses differ?

8. What characteristics distinguish the balmacaan coat, capecoat, chesterfield coat, princess coat, trench coat, and wrap coat?

9. Which styles of women's jackets more appropriately complement women's apparel?

10. How do styles of men's jackets differ?

11. How do the features of men's trousers and slacks differ?

12. In what ways do shirt front style, collar style, and cuff style influence the style of men's dress shirts?

13. What are four types of men's coats, and how do they differ?

14. Why is it important for employees to understand factors that affect the coordination of clothing?

15. What factors should be considered when choosing color schemes?

16. How do texture, weight, and hand affect the coordination of apparel?

17. Why should the intended use of accessories, the design of garments and accessories, and the materials used to construct accessories be analyzed when choosing accessories to complement apparel?

17

Marketing: Promotions and Special Events

ESSENTIAL ELEMENT

- Apply marketing techniques when assisting with promotions and special events.(q7A)

OBJECTIVES TO ACHIEVE

- Explain various considerations involved in marketing products and services to customers.
- Relate ways in which advertising may be used in fashion promotion.
- Describe how public relations and publicity are used in fashion promotion
- Discuss various types of special events used in marketing fashion products and services.
- Outline personal selling techniques that contribute to successful marketing of products and services.

Fashion can be defined in several different ways. *Webster's New World Dictionary* defines fashion as "the current style or mode of dress, speech, or conduct." Other references describe fashion as the style(s) of clothing and accessories prevailing at a certain time. As described in Chapter Two, most fashion sources agree that a fashion is a style that is accepted and used by the majority of a group at any one time. A variety of products have fashion appeal in addition to apparel. For example, sheets, furniture, draperies, and other textile-related items are designed using current styles that are popular in the marketplace. Therefore, the marketing of fashion apparel includes apparel, accessories, and a variety of other fashion oriented goods.

An increased focus on fashion in society has resulted in thousands of people being employed in fashion-related jobs. As discussed in Chapter Two, fashion industries are those industries involved in manufacturing the materials used in the production of apparel and accessories for men, women, and children. ***Fashion business*** is a broader term describing any business concerned with goods or services in which fashion is a factor. Included are manufacturing, distribution, advertising, publishing, and consulting.

Marketing is a system of business activities designed to plan, price, promote, and distribute products and services to customers. ***Merchandising*** refers to the planning required to present the right merchandise at the right time, in the right place, in the right quantities, at the right prices, and with the right sales promotion. Fashion, marketing, and merchandising are considered to be sciences by many experts because they involve known facts and basic principles. Because of these facts and principles, actions and reactions of consumers can often be predicted.

There are a variety of jobs available in the area of fashion marketing and merchandising. Chapter Eighteen addresses the area of visual merchandising. Some of the jobs available in fashion marketing are referred to as ***fashion communications*** jobs. Examples of fashion marketing and fashion communications jobs include fashion journalist, fashion writer, fashion illustrator, fashion trend researcher, and fashion advertiser. A ***fashion journalist*** reports fashion news by writing newspaper and magazine articles. A ***fashion writer*** develops educational or training materials on fashion, apparel, and textiles. A ***fashion illustrator*** draws illustrations of apparel on fashion models for use in advertising, promotion, publicity, and journalism. A ***fashion trend researcher*** collects information about current and future trends in the fashion industry and predicts how consumers will react to fashion trends. A ***fashion advertiser*** is employed by a retailer, manufacturer, newspaper, or advertising agency to develop ideas for promotion of fashion goods.

There are numerous entry-level jobs available in the area of fashion marketing and communications. Some entry-level employees serve as assistants to professional level employees. As in other employment areas, entry-level employees may be promoted when experience and skills are gained.

MARKETING CONSIDERATIONS

Since marketing involves planning, pricing, promoting, and distributing products and services to customers, it is important to gain an understanding of customers in order to market effectively. The ***environment*** refers to the conditions in which people live. Several environmental factors influence fashion interest and demand.

Market Segmentation

To market products and services, fashion businesses try to identify and select target markets. A ***target market*** is a particular group of individuals who have similar characteristics that make them potential customers for a particular good or service. In the marketing process, businesses attempt to determine who their customer is, what the customer's interests are, how much the customer will pay for goods or services, where the customer is located, and how many customers there are in the target market. By separating the total consumer market into smaller groups, ***market segmentation*** is accomplished. The smaller groups are called ***market segments***. Market segments are studied by producers and retailers according to different characteristics of consumers in each segment. Demographic and psychographic information helps marketers analyze market segments and identify target markets.

Demographics are studies that help to place customers and consumers into target groups. Examples of demographic characteristics studied by marketers include population distribution such as urban, suburban, and rural populations; age; sex; family life cycle stage; religion; ethnic background; educational level; occupation, and income. Demographically, the middle-income group in American society has become the most important market for fashion merchandise.

Psychographics are studies that help marketers identify more personal traits of customers. Factors are considered such as personality; attitude, interests, and personal opinions; and actual product benefits desired by customers. Psychographic studies help businesses understand the behavior of customers. Thus, marketers are able to match the image of the company and its product or service with the type of consumer using the product or service.

Economic Factors

Fashion growth occurs in societies with high levels of economic development. One indicator of economic development is consumer income. ***Consumer income*** is measured in terms of personal income, disposable income, and discretionary income. ***Personal income*** is the total income received by the population as a whole. ***Disposable income*** is the amount of take-home pay a consumer has during a given year and indicates purchasing power. ***Discretionary income*** is the money available to an individual or family after necessities (food, clothing, shelter, and basic transportation) have been purchased.

Even though personal income may increase in a society, other economic factors can affect the purchasing power of consumers. For example, inflation can decrease purchasing power. ***Inflation*** is an economic situation in which demand exceeds supply. A substantial rise in the general price level of goods and services results. Thus, individuals and families are not able to buy as many goods and services as before even though they have the same income level. A ***recession*** is a low point in a business cycle. During a recession, interest rates are high, production decreases, and the unemployment rate increases. Both inflation and recession have profound effects on fashion marketing since extreme economic situations affect consumer spending.

Population

Population figures for a society are indicators that relate to fashion demand. The United States has a history of significant population growth. During the last seventy years, population has grown approximately 58 percent (from 106,000,000 in 1920 to a projected 249,731,000 in the 1990s). With increasing population, projections may be made regarding fashion demand.

The age mix of a population also affects fashion demand. The growth rate is different for different age groups and for both sexes. The largest and fastest-growing age group in the United States today is the twenty-five to forty-four-year-old group. Because of the lower birthrate of the early 1970s, there were fewer people under age fourteen in the mid 1980s than before. The number of people over age sixty-five has grown as a result of the longer life span of both men and women. With early retirement and increased retirement incomes, this group has significant influence on fashion demand. Since each population group has its own special fashion interests, needs, and reactions, changes in the age mix serve as important clues for marketers in predicting fashion needs and demands.

Sociological Factors

Fashion is viewed by some as a symbol of changes occurring in society. Consumers are influenced by changes in society. As consumer attitudes change, fashion changes. The increased leisure time of the average citizen is a societal change that has influenced fashion. ***Leisure time*** is time that can be spent away from work. People choose to spend their leisure time in various activities including sports, travel, entertainment, and self-improvement. Increased leisure time has caused consumers to demand clothing for casual living. More people require active sportswear for activities such as biking, skiing, tennis, golfing, and sky diving. The increased interest in maintaining good health requires special clothing for exercise and active lifestyles.

The status of women has changed drastically in our society since the early 1900s. As a result, more women are employed than ever before. Employed women are constantly exposed to fashion. They have an incentive to dress appropriately for their employment settings. In some cases, employed women have more discretionary income which may be used to purchase fashion items. When women reach higher educational levels, they are often more willing to accept new fashions. Such acceptance accelerates fashion change. In general women have more social freedom today than before. This freedom has changed lifestyles of women and influenced their preferences for fashion.

Various ethnic groups in the United States have influenced fashion profoundly. Asians constitute the fastest-growing minority group in the United States today. Hispanic Americans also constitute a fast-growing minority group. Black citizens are better educated and hold higher-level jobs than they did in the past. The entry of thousands of immigrants from other countries to the United States has resulted in many societal changes. Each of these ethnic groups has made a significant impact on society by introducing color preferences, musical and dance styles, and textile designs that have in turn influenced the fashion industries.

FASHION PROMOTION

The success of the overall merchandising process is evident in its final phase, the promotion and selling of merchandise. The terms, ***fashion promotion, sales promotion,*** and ***promotion*** may be used interchangeably. These terms refer to all activities used to bring customers into a store and influence their decisions to make purchases. Promotion includes both personal and nonpersonal activities. ***Nonpersonal promotion*** includes advertising, window and interior display (visual merchandising), publicity, special events, fashion shows, and public relations. ***Personal promotion*** or ***personal selling*** is the oral presentation used in conversation with a shopper for the purpose of making a sale. All retail stores use promotional activities to inform customers and to persuade them to buy.

As described in Chapter Six, products experience life cycles. They are introduced, are accepted, become popular, and eventually lose their sales appeal. Marketers must consider the stage of the life cycle for each product being promoted. A new product requires various promotional activities such as informing potential customers about the product, its uses, and benefits. A new product may be advertised, promoted through personal selling, and featured at trade shows or exhibits. Often, companies test promotions before using them in different locations. As customers accept a product, a company's promotional activities are adjusted. Promotional activities may be planned to persuade customers to continue buying the product such as offering rebates or special gifts to those who buy the product. When a product reaches the end of its life cycle, a business is likely to reduce its promotional activities.

Fashion promotion is conducted at various levels of the fashion industry. ***Producers*** are businesses that manufacture raw materials. ***Manufacturers*** are wholesalers of finished products. ***Retailers*** sell finished products to customers. All firms in the fashion industry participate in promotional activities. At every level of an industry, someone sells products and ideas to someone else. Figure 17.1 illustrates the multi-step process of marketing products from raw materials to the consumer.

At the retail level, the store management makes sales promotion policies and identifies the goals of sales promotion. The management approves the image to be presented, sets the sales promotion budget, decides what media to use, and plans the calendar of events for promotional activities. A store's sales promotions may be coordinated by a person or by a department. In smaller stores, one person may coordinate all sales promotion activities. In larger stores, a sales promotion division may be responsible for promotion through advertising, display, and publicity. Some stores have a separate public relations office that works closely with the sales promotion division.

In a shopping center or mall, merchants may combine their efforts for some promotion activities. Examples include sponsoring a Santa Claus, an arts and crafts exhibit, a petting zoo, and a sidewalk sale. When such events are advertised, the name of the shopping center or mall is used so that customers are attracted to all of the stores in the retail area.

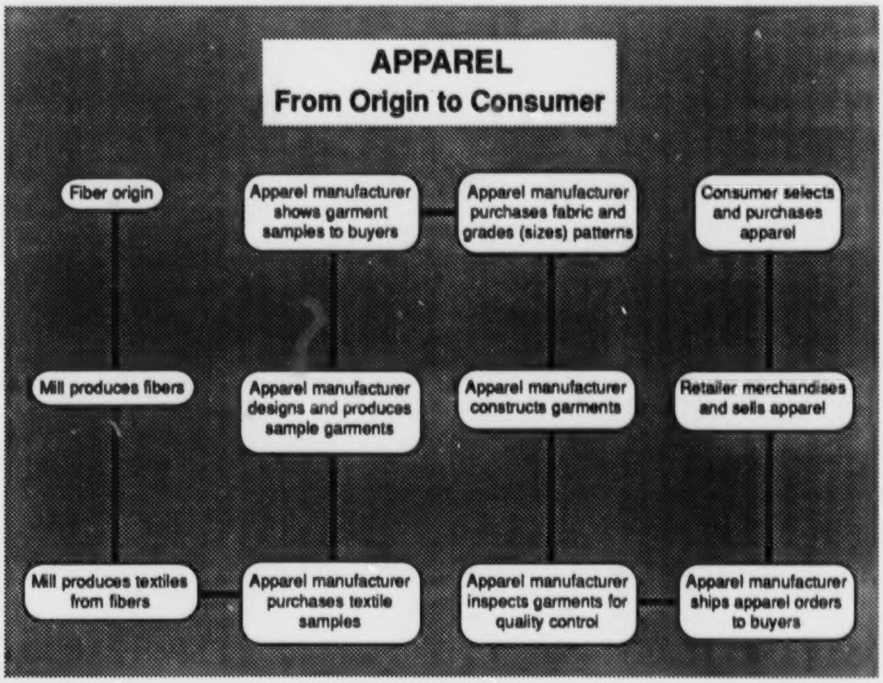

APPAREL
From Origin to Consumer
Fiber origin
Mill produces fibers
Mill produces textiles from fibers
Apparel manufacturer purchases textile samples
Apparel manufacturer designs and produces sample garments
Apparel manufacturer shows garment samples to buyers
Apparel manufacturer purchases fabric and grades (sizes) patterns
Apparel manufacturer constructs garments
Apparel manufacturer inspects garments for quality control
Apparel manufacturer ships apparel orders to buyers
Retailer merchandises and sells apparel
Consumer selects and purchases apparel

Figure 17.1

Advertising

Advertising is a nonpersonal promotion method used to influence sales by sending messages through media to an audience of potential customers. The purpose of advertising is to inform the public about goods and services available and to influence the selling of goods, services, and companies. Large businesses often use planning committees to develop advertising plans. These committees may include representatives from various areas such as marketing, sales, merchandising, and sales promotion. Advertising plans should be made for at least six months at a time. Fashion advertising is often planned on a seasonal basis. Checking past sales records helps to identify when and how often to advertise. A record of advertisements should be kept so that past experience can guide future decisions. A scrapbook of past ads with notes about costs and results aids in making good advertising plans.

Small stores may use one person, often the owner or manager, to coordinate advertising. Sometimes, advertising agencies are hired by retailers. ***Advertising agencies*** create, prepare, and place ads for a fee. Many aids for constructing ads are available free or at little cost. Manufacturers may provide photographs or sketches of their garments, or suggested copy layouts called ***mats*** to assist in the preparation of retail ads. Retailers often obtain such aids during trips to market.

Advertising may be classified by the sales objectives it is used to reach. The two broad categories of advertising are product advertising and institutional advertising. The main objective of ***product advertising*** is to immediately sell merchandise. Product ads include an identification, a description, and the price of products. Based on the ad, customers can make a decision to purchase the featured item(s) or decide to visit the store where personal selling is used to complete a sale. ***Institutional advertising*** is used to build a positive reputation for a company. Its main objective is to retain customers over a long period of time. Institutional ads are used to promote departments, services, facilities, features, merchandise, and personnel of a business. These ads are used to convince customers of a company's benefits and positive qualities.

Successful advertisements include the following common characteristics:

- The main idea is clearly presented.
- The sales objective is obvious.
- The ad builds on other ads used by the company in order to provide continuity.
- A consistent style is used in all ads by the company.
- The visual part of the ad or commercial is related to the verbal part.
- The ad is simple, concise, and direct.

These characteristics may be used to evaluate effectiveness of advertising presented in the newspaper, in telephone directories, on the radio, on television, through direct mail, or through other media.

Each type of advertising has advantages and disadvantages. Newspaper advertisements reach the largest audience for the least amount of money and can be changed quickly. Radio spots are inexpensive to produce and can be changed frequently, but do not permit visual presentation of merchandise. Direct mail can be effective if the mailing lists are chosen carefully. Television commercials require the services of specialists, are expensive to produce, and are difficult to change. Because many people depend on television for entertainment and communication, many retailers feel that the expense and time involved in television advertising are worthwhile.

Public Relations

Public relations is a broad term that covers a company's overall program of creating goodwill. The area of public relations includes all activities used to develop goodwill with the public, the community, the government, and customers. An important part of public relations may be to educate the public regarding a particular point of view or the use of a product. To be effective, public relations must be well planned and must be implemented by all employees in a company.

A good public relations program presents a positive image of a store to the community. Having an image as a financially sound, progressive organization is an advantage to a business. Public relations also helps emphasize that a business' actions and statements are dependable, honest, and truthful. When developing a public relations plan, the management of an organization must consider what type of image they wish to project. Management may choose to offer services such as delivery, installation, and gift wrapping to help in the development of a positive image.

Publicity

Publicity is an important part of the public relations process that cannot be directly controlled by the retailer. ***Publicity*** provides verbal or written information through a news or feature story about a product, place, thing, person, or idea. Publicity can result from an event that is deliberately created or from alert coverage of an event occurring that is of interest to a firm's target market. Some may consider publicity a free form of advertisement since companies do not pay for media coverage of events. However, publicity is actually never free. Companies must invest money into programs that will motivate influential columnists, commentators, publications, and personalities to report on them positively.

The most commonly used method for communicating publicity material to the media is through use of ***publicity releases*** or ***press releases***. A press release is used to describe upcoming events, new products, and other news that is of public interest. Press releases are used by different media in different ways. One newspaper might use a release as a minor news item and another newspaper might use it as a feature story.

To gain publicity, it is important to understand the news business and how editors and producers evaluate material for their publications and broadcasts. Knowing who to send publicity material to and maintaining continued, friendly contact with these individuals is very important. It is vital to understand the content and layout of newspapers and magazines which reach a target market. Publicity people should also become familiar with the programming and broadcast schedules of radio and television stations that reach their target market. Everything appearing in a newspaper or on a television news program is not news. Newspapers, magazines, radio stations, and television stations attempt to give their audiences good reasons to read, watch, or listen. The publicity person must provide publicity information that will fit the specific goals and needs of each publicity medium.

There are two primary factors that influence a newspaper editor's decision about using a story submitted for publicity. One factor is the amount of space available in the newspaper for the publicity material. Newspapers must devote a certain amount of space to paid advertising in order to make a profit. The second factor is the other material that is presently competing for the available space. Each press release will be evaluated in terms of its importance to the readership. If there is competition for space, press releases of little interest to potential readers will probably not be used. Thus, it is very important to prepare a press release for the potential audience and send it to the right newspaper editor. Most newspapers are organized into departments. Key people to know include the city editor, the business manager, and various department editors who serve specialized interests such as gardening, art, music, society information, education, and fashion.

Television programming consists mainly of network programs and movies. Therefore, there is little chance to receive publicity from television except for major events or through local programs. Radio offers good opportunities for coverage of local events. Broadcast media are required to use a certain portion of their air time free of charge for coverage of public service activities. The publicity person for a firm should target news programs, panel and interview programs, and special interest programs produced locally as potential sources for publicity.

News coverage results when people are involved in various types of activities. Getting the store owner or a key manager to speak to business groups may gain publicity. Presenting a special award from a store can result in publicity also. Sponsoring a contest in the community or key employees becoming active in local organizations are other methods of gaining valuable publicity. It is crucial that a message presented through publicity is consistent with the experiences customers have when they visit a store. Otherwise, all of the publicity efforts are of no value.

Special Events

Special events that involve customers often result in publicity. A ***special event*** is a device, feature, service, sales inducement, exhibit, demonstration, or attraction that is used to influence someone to buy merchandise. The store's publicity department distributes press releases about special events to gain as much publicity as possible. Some special events are designed especially for publicity but may also be successful at selling merchandise. Certain events may be so popular that they become traditional events.

Sometimes, special events are planned to simply draw the public to a store, mall, or shopping center. The presentation of a well-known celebrity from a children's television show may draw families into a retail area. Seasonal parties for children such as a Halloween event may also be used to gain publicity, establish goodwill, and bring crowds to a store to gain exposure to merchandise.

Merchandise Events – Special merchandise events may be offered to the public. Such events are often developed around themes such as patriotic, cultural, seasonal, holiday, and traditional themes. An example of a traditional theme is the annual white sale of linens conducted in many retail stores during January. A number of stores through the country have used ethnic themes to promote imported fashion merchandise. Imported items from countries in the Far East, South America, and Europe are often promoted by taking advantage of the unique qualities of the ethnic merchandise.

Demonstrations and Educational Events – Some retail stores conduct demonstrations and educational events for promotion. Such events promote merchandise while developing good public relations. Cosmetic departments frequently use demonstrations to promote their products. Trial samples may be given to customers to help them in deciding on purchases. A demonstration on creative ways to use scarves as fashion accessories is another example of a promotional demonstration. Often, demonstrations are presented by individuals who are trained by manufacturers and are highly skilled at showing products and their uses. An educational event such as a lecture by a well-known, make-up artist on beauty trends may be used to gain publicity and promote products. A workshop on decorating with sheets and towels might be used as a special event.

Fashion Shows – A ***fashion show*** is a special event that provides opportunities to present fashion merchandise in living and moving form. Fashion shows are usually presented for customer audiences. However, they may also serve to orient, train, and stimulate the personnel of large stores. The fashion show is a promotional event that is very important in the fashion industry.

A fashion show is a dramatic event that produces excitement and entertainment. Fashion shows can range from very formal productions with professional models, music, scenery, and professional staging to informal shows using customers and employees as models. The formal show has a theme that is identifiable. It is a staged production with a script and commentary. The formal show generally involves inviting an audience; the audience is usually seated and the show has the characteristics of a theater production. It is always important to use a commentator who has good speaking skills and ability to improvise.

An informal fashion show is not as rehearsed as a formal show. In addition, the theme may not be as easy to identify. Sometimes a commentator is not used in an informal show. The audience members may read information describing the merchandise being shown from cards or programs. Sometimes an informal fashion show is called a ***showing***.

In addition to classifying fashion shows according to how formal they are, they may also be classified by the type of audience and the sponsor. Fashion shows are conducted at different stages in the marketing process. The ***industrial show*** or ***trade show*** is sponsored by a producer of raw materials such as a producer of textiles or a manufacturer of apparel. The audience for the industrial or trade show usually consists of industry professionals and members of the press. For example, a trade show may be presented by a producer of textiles for apparel designers, retailers, buyers of fabric for apparel manufacturers, and members of the press. In turn, a fashion designer may present a fashion show for retailers and members of the press. .

A ***retail show*** is sponsored by a retailer and may be presented to various types of audiences. There are different types of retail shows including the in-store show, the customer show, and the charity show. An ***in-store show*** is used to educate store employees regarding new fashion merchandise the store will promote. These shows provide information, stimulate enthusiasm, and suggest ways to sell the merchandise. The ***customer show*** is presented to customers and features themes such as seasonal merchandise, designer fashions, or private label apparel. Sometimes, a manufacturer will assist in presenting a customer show that features its merchandise. A manufacturer may send special sales representatives to present shows that are called trunk showings. ***Trunk showings*** are informal, are presented on the selling floor, and may be presented prior to the selling season. A ***charity show*** is usually co-sponsored by a retailer and a local institution (such as a school or hospital) or fund-raising charity. These shows sell merchandise, promote goodwill, and build a positive image for the retailer.

The planning of a fashion show is important to the show's success. Employees may be assigned the responsibility of conducting various aspects of a fashion show such as preparing clothing, assisting models, setting up the stage, and a variety of other jobs. The following factors should be thoroughly planned in preparation for a fashion show:
- theme
- fashion show coordinator
- audience
- overall plan
- merchandise
- models
- budget
- staging
- dressing space
- commentary
- program
- rehearsal
- promotion and publicity

Visual Merchandising

Visual merchandising, also known as ***display***, is a nonpersonal physical presentation of merchandise or ideas at the point of sale. This promotion method includes window, exterior, interior, and remote display. Many retailers believe that display serves as a bridge between mass communications and personal selling in the store. The details of visual merchandising are included in Chapter Eighteen.

Personal Selling

The customer's primary contact with a retail store is the sales personnel. From the customer's viewpoint, the salesperson represents the retail organization. Therefore, the salesperson's role is vital to the success of the retailer. Because of this fact, good retail organizations provide continual training programs for their employees to ensure that employees understand personal selling techniques. Effective retail executives at the management level are aware of the importance of knowing the reaction of customers to various marketing techniques and to the merchandise and services provided by their store(s). A salesperson must do the following in order to be successful at personal selling:

- Be familiar with the product and services sold in the store and understand important qualities of them from the customer's perspective.
- Understand that many customers are too sophisticated to be talked into buying merchandise they do not want.
- Understand the importance of believing that the customer is always right in terms of providing customer service and resolving complaints.
- Be aware of the merchandise that is in stock so items can be located quickly.
- Understand what customers expect from salespeople in terms of service, information, and advice.

The two basic types of selling are self-service and personal or personalized selling. ***Personal selling*** or ***personalized selling*** involves an oral presentation with a prospective customer for the purpose of selling merchandise, services, or ideas. It involves a salesperson who personally approaches a customer and completes a sale. Selling that is conducted in a retail store on the selling floor is also called ***point-of-sale selling***. ***Self-service*** reduces the number of salespeople or eliminates all salespeople from the selling process. The advantages of self-service are a reduction in the retailer's selling cost due to reduction in sales employees' salaries, increased efficiency when selling some types of merchandise, and some customers prefer self-service. The advantages of personalized selling are some customers prefer personal attention and salespeople may suggest additional merchandise and increase overall sales.

An effective salesperson knows that the objective of personal selling is to help customers buy what they want and need. It is important for a salesperson to seize opportunities to suggest advantages of goods or services, often called ***selling points***. An ethical salesperson will not persuade customers to buy items they do not want. The most important aspects of the personal selling process are the following:

- Get the customer's attention.
- Create an interest and desire for the product or service.
- Stimulate the customer to action (buying).
- Maintain customer satisfaction to avoid returns and ensure future business.

There are a variety of ways in which a skilled salesperson relates to customers and is effective in selling. Merchandise should be presented immediately and should be handled carefully to show appreciation for the quality of the goods. It is always best to shown merchandise in use when possible. Customers should be encouraged to touch and handle merchandise. It is best to avoid showing too much merchandise at one time. This sometimes confuses customers. If a salesperson shows moderately priced merchandise first, it is easy to observe a customer's reactions and immediately know whether to show more expensive merchandise or less expensive merchandise.

In selling, the salesperson should tell the customer what he or she wants to hear about the particular merchandise under consideration. Telling a customer what the merchandise will do for him or her gives the customer reasons to buy. Positive aspects of the merchandise should be emphasized. If a customer raises objections to merchandise, the salesperson should not argue with the customer. If necessary, it is best to accept the customer's objections and point out another feature of the merchandise that is positive.

Closing the sale is an important part of the selling process. There are several techniques to use when closing a sale. The salesperson should usually refrain from showing merchandise other than the item(s) being considered by the customer. It is best to narrow the selection of merchandise to the items the customer in which the customer seems most interested. Sometimes, the salesperson may want to suggest stimulators, questions that stimulate a response or decision from the customer. For example, a salesperson may say "Which of these do you like best?" or "Would you like to charge this?" Salespeople may be able to make additional sales by suggesting merchandise to the customer that is related to the item(s) being purchased. For example, if a customer buys pants or slacks, the salesperson may suggest a blouse or shirt that coordinates well with the selected item. In addition, salespeople should also alert customers regarding sales, specials, and advertised merchandise that is presently available.

Points to Remember

- Fashion is a style that is accepted and used by the majority of a group at any one time.
- Marketing is a system of business activities designed to plan, price, promote, and distribute products and services to customers. Merchandising refers to the planning required to present the right merchandise at the right time, in the right place, in the right quantities, at the right prices, and with the right sales promotion.
- A variety of jobs exist in the fashion marketing or fashion communications area including fashion journalist, fashion writer, fashion illustrator, fashion trend researcher, and fashion advertiser.
- Fashion businesses try to market products to particular groups of people who have similar characteristics that make them potential customers. Demographic and psychographic information helps marketers analyze market segments and identify target markets.
- The amount of personal, disposable, and discretionary income available to individuals and families affects the economic development of a society.
- Inflation results when demand exceeds supply.
- A recession is a low point in a business cycle.
- Characteristics of the population in our society relate to fashion demand.
- Sociological factors such as leisure time, the status of women, and ethnic groups influence fashion.
- Fashion promotion, sales promotion, and promotion are terms that refer to all activities used to bring customers into a store and influence their decisions to make purchases.
- Products go through life cycles and marketers should consider the stage of the life cycle for each product being promoted.
- Fashion promotion occurs at different levels of the fashion industry including production, manufacturing, and retailing.
- Advertising is a nonpersonal promotion method used to influence sales by sending messages through media to an audience of potential customers.
- The two broad categories of advertising are product advertising and institutional advertising.
- Public relations covers a company's overall program of creating goodwill.
- Publicity provides verbal or written information through a news or feature story about a product, place, thing, person, or idea.
- A special event is a device, feature, service, sales inducement, exhibit, demonstration, or attraction that is used to influence someone to buy merchandise.
- Examples of special events are merchandise events, demonstrations and educational events, and fashion shows.
- Visual merchandising, also known as display, is a nonpersonal physical promotional presentation of merchandise or ideas at the point of sale.

- Personal selling is an oral presentation with a prospective customer for the purpose of selling merchandise, services, or ideas.

Words to Know

advertising
advertising agencies
charity show
consumer income
customer show
demographics
discretionary income
display
disposable income
environment
fashion advertiser
fashion business
fashion communications
fashion illustrator
fashion journalist
fashion promotion
fashion show
fashion trend researcher
fashion writer
industrial show
inflation
institutional advertising
in-store show
leisure time
manufacturers
marketing
market segmentation
market segments
mats
merchandising
nonpersonal promotion
personal income
personalized selling
personal promotion
personal selling
point-of-sale selling
press releases
producers
product advertising
promotion
psychographics
public relations
publicity
publicity releases
recession
retailers
retail show
sales promotion
self-service
selling points
showing
special event
target market
trade show
trunk showings
visual merchandising

Questions for Review

1. What is the difference in marketing and merchandising?
2. How is market segmentation used to target markets?
3. What are the differences in demographics and psychographics?
4. How do families' and individuals' incomes influence fashion growth?
5. What are three examples of sociological factors that have significantly influenced fashion in the United States of America?
6. What are the three levels of the fashion industry at which fashion promotion is conducted?
7. How is advertising used to inform the public?
8. What are the two broad categories of advertising?
9. Through what methods might a retailer gain publicity for a business?
10. What is an example of a merchandise special event?
11. What different types of fashion shows may be presented?
12. What are the most important aspects of personal selling?

18

Visual Merchandising

ESSENTIAL ELEMENT

- Prepare fashion displays.(q7B)

OBJECTIVES TO ACHIEVE

- Identify jobs available in display.
- Discuss major types of window displays, responsibilities related to window displays, types of windows, and components used in window displays.
- Review the major types of interior displays and their uses.
- Analyze ways in which design elements are used in the creation of displays.
- Determine ways in which design principles are used in the creation of displays.
- Outline the most common display arrangements, how signage is used in displays, and the types of fixtures that are used in displays.

As previously noted, display is defined as a nonpersonal physical presentation of merchandise or ideas at the point of sale. ***Visual merchandising*** refers to various methods used to make a business attractive and efficient in selling merchandise. Visual merchandising includes store design and layout, lighting, signs, fixtures, and displays. Interesting displays of merchandise in windows and inside stores are created to persuade customers to identify with certain styles and fashion ideas. Good displays attract customers into stores and into departments within stores. Interior displays and point-of-purchase (POP) displays are even used in some stores as substitutes for personal selling.

EMPLOYMENT IN DISPLAY

The responsibility for creating displays is assigned to specific employees. In small businesses, the owner or manager may assign display work to employees who were not specifically hired or trained in visual merchandising. A display director may be hired in a large store. The ***display director*** or ***visual merchandising director*** is responsible for planning and creating all exterior and interior displays. The director supervises and coordinates the work of other display employees and coordinates display plans with advertising and publicity directors.

A ***display specialist*** is a person who is specifically trained or talented in one area of visual merchandising (such as lighting or animation); display specialists are hired by some stores. A ***display assistant*** is an entry-level display employee. He or she assists the display specialist in construction, installation, and maintenance of displays. A display assistant may also perform general housekeeping duties in the display department. A ***trimmer*** usually has more display experience than an assistant. The trimmer may create designs or implement designs of the display director. He or she has some skill in arranging displays, selecting and using accessories, and fitting mannequins. A ***freelance display specialist*** provides display services to businesses for a fee. A business that does not have a display department may hire a free-lance display specialist.

Although display employees often coordinate display development, other employees are involved in the process. Owners and managers of small stores may develop and build displays. Buyers and department managers of larger stores may suggest display ideas. In some stores, buyers coordinate at least part of their own departments' displays but ask for help from the display department. Salespeople and stock personnel may set up, straighten, and restock displays.

WINDOW DISPLAYS

Window displays promote sales by showing customers available merchandise. Window displays serve their functions while a store is open and after the store closes. Two major categories of window displays are selling displays and prestige displays. ***Selling displays*** are designed to sell merchandise immediately. ***Prestige displays*** or ***institutional displays*** are designed to project a positive image for the store. The principles that make an advertisement effective are also used to create effective window displays. Many retailers consider window displays to be their most effective form of sales promotion.

Types of Window Displays

Series displays are those in which several adjoining windows are used to display a common merchandise theme. ***Related displays*** are those in which various classifications of related merchandise are arranged in one window. A related display tells a merchandise story and shows items that are used together or during the same season. For example, a man's suit might be displayed with coordinated shirt, tie, shoes, and jewelry.

Single-category displays are those that feature a single type of merchandise at one price. ***Campaign window displays*** are those in which the same type of merchandise is featured for several weeks in the same windows. A specific sales message is repeated for a period of time. ***Single-promotion displays*** are those using a major selling event in all or most of a store's windows. Sometimes, these displays are called ***special event displays*** and are used to celebrate events such as holidays, business and community recognition days, store anniversaries, and special promotions. ***Sale displays*** are used to show bargain or clearance sale merchandise. ***Line-of-goods displays*** are used to show items from one manufacturer. ***Mass displays*** usually include many varied, low-priced items.

Responsibilities Related to Window Displays

When retailers use the ***departmental method*** of assigning responsibility for window displays, certain windows are assigned to certain departments. The

rotation method involves the rotation of window assignments from one department to another in order to display a wide assortment of merchandise. The management of each store decides on the merchandising policies for the store. It is important that window displays project the store's attitude and desired image toward fashion trends, featured brands and styles, and fashion themes.

Most stores change their window displays once each week. Each store develops a policy regarding how frequently displays are changed. A store located in a high traffic area may change window displays frequently. Stores in smaller communities may change their window displays more frequently than stores in larger cities. Stores in residential locations may be viewed more frequently than stores in business districts. In order to keep customers interested, displays should be changed at regular intervals. The advantages of frequent changes in window displays include the following:

- Current merchandise can be featured.
- A greater assortment of merchandise is featured.
- Merchandise does not become faded or soiled through long-term display.

Types of Windows

Three types of windows are commonly used in retail stores. An ***open window*** permits customers to see into the interior of the store. The ***closed window*** is a closed-in compartment which does not allow customers to view the inside of the store. The ***semi-closed window*** has a partial background that hides some of the store's interior. The open window is frequently used in shopping centers having large amounts of automobile traffic rather than pedestrian traffic. Open windows allow projection of selling areas to people passing by a store. Potential customers form an impression of the interior of the store. Open windows are less expensive to construct and maintain than closed windows. Open windows allow customers to see inside activity that may entice them to enter the store.

Some retailers feel that open windows have certain disadvantages. Open window displays may not be as dramatic as those presented in closed windows. Open windows allow the interior of the store to be viewed at all times. Some customers may not enjoy shopping in a store where they are on view. In addition, if the store is empty, a negative image may be projected, and customers may not wish to enter. It is difficult to emphasize a single item or theme in an open window display. Open windows also allow less space around exterior walls for storing stock.

Components Used in Window Displays

The following physical components are used when arranging window displays:

- merchandise
- functional props
- decorative props
- structural props
- background
- floor covering
- lighting

The designer of a window display must use creativity in combining all of the display components in a manner that is appealing and attractive.

Merchandise is the central focus of any display. It should be chosen carefully to meet the store's objectives and should be consistent with store policies. The merchandise selected should be attractive, of interest to customers, and timely. ***Functional props*** are used to physically support or hold merchandise. These props include mannequins, apparel or jewelry forms, screens, pedestals, tables, and stands. ***Decorative props*** include a wide variety of materials and items used to establish a mood or setting for the merchandise being displayed. ***Structural props*** are items such as boxes, stands, and cylinders that are used to support functional and decorative props.

A display background may be used to communicate a theme or may contrast with merchandise in the display. It is important that a background blends with the remainder of the display instead of detracting from the merchandise. Materials such as fiberboard, fabric, and wallboard are used for backgrounds. Background materials may be covered or painted.

The floor covering should blend well with the display background and should not detract from the merchandise being displayed. Often, neutrals such as gray, black, and beige or used for floor coverings. Materials such as carpet, cork chips, rocks, grass mats, straw mats, and woven materials may be used for floor coverings.

Lighting directs the customer's attention to the display. Effective lighting may be used to highlight merchandise features such as texture, color, and size. ***Floodlighting*** is a lighting technique that directs light over the entire display area. Recessed ceiling lights are often used for floodlighting. ***Spotlighting*** is used to focus attention on particular spots or items. ***Pinpointing*** focuses a narrow beam of light on a specific item.

The colors of the window background and the merchandise affect the amount of light needed. Because light colors reflect light, less lighting is needed for light colors and backgrounds. Dark colors absorb light so that more light is required. Colored lights are sometimes used in displays to create contrasts and special effects.

Lighting fixtures should usually not be seen in displays. Lights may be attached to the ceiling or placed behind props or merchandise. Lights should never be placed near flammable objects. Window display units should be well ventilated to prevent heat build-up as a result of lights overheating.

INTERIOR DISPLAYS

Displays inside a retail business are called ***interior displays***. Interior displays are used by most retailers in combination with window displays and advertising. The following three major objectives are involved in the planning of interior displays:

- presenting assortments of merchandise
- introducing ideas to customers
- suggesting related merchandise

Interior displays help customers locate merchandise they have seen in windows and ads. Interior displays can create an image and a personality for a store. New looks can be created as needed.

Interior displays should be located where customers will see them. There are certain locations in stores that most retailers use for display purposes. The following places are good locations for interior displays:

- near store entrances and exits
- at the ends of aisles
- near service counters
- at angles to store traffic
- at eye level
- at check-out counters and near cash registers
- next to related items
- near entrances to departments
- in front of open window displays

Types of Interior Displays

There are several types of showcase displays. ***Showcase displays*** include all of the following:

- sides of selling cases where merchandise can be viewed through the glass
- glassed-in wall cases behind a counter where stock is stored and merchandise can be seen
- open, recessed areas above and behind the selling counter called shadow boxes
- interior windows usually built into spaces beside doorways, elevator areas, escalators, and stairways

Counter displays are arrangements of merchandise on selling counters. A display on a selling counter must be limited to prevent interference with personal selling. In addition, large counter displays may hide other merchandise in glass counters. Counter displays are most useful in helping salespeople show customers various selling points to motivate them to purchase.

Platforms are often used to display fashion merchandise. Platforms are stages that elevate the display area. Display employees often add artistic and dramatic effects to platform displays. Platform displays allow expensive items to be displayed without the merchandise being easy to touch. Clothing on full-size mannequins is typically displayed on platforms.

Shadow boxes are small, enclosed display boxes that are open on one side only. They are sometimes built into interior walls or placed above counters. Usually one item is displayed in a shadow box. Such displays are especially appropriate for expensive items such as jewelry. In addition, fashion merchandise such as shoes, gloves, men's ties, and handbags can be appropriately displayed in shadow boxes.

Environment displays involve placing merchandise in a realistic, life-size setting. Furniture and appliances are often featured in environment displays. These lifelike displays help customers imagine the benefits and satisfactions they would obtain from ownership of the featured merchandise.

Miscellaneous displays include a variety of other interior display techniques used by stores. ***Island displays*** or ***gondolas*** are designed using large, open display tables that are stacked high with featured merchandise. An island display can be approached from all sides and may be created in floor space that is otherwise not being used. ***Free-standing display units*** are sometimes placed in areas where traffic allows them. One type of free-standing display unit is an aisle display. Aisle displays are placed at the end of aisles that come to a dead end. Other displays are placed in stores depending on the particular space and facilities available. Walls, columns, and ledge space are often used for display areas. ***Hanging displays*** are displays suspended from the ceiling or other support. The displays are usually suspended by strong, invisible wire. Fashion goods are often suspended to attract attention. Too many hanging displays tend to give a store a cluttered appearance.

Point-of-purchase displays (POP displays) are displays arranged in areas where customers make shopping decisions. Manufacturers of merchandise often provide POP displays to retailers. With increased technology, POP displays may include items that attract customers' attention such as computerized devices. For example, a cosmetic company may provide a computerized display that allows customers to respond to questions regarding skin and hair color, skin tone, and other factors that affect choice of cosmetics. ***Self-selection displays*** are displays designed to help customers select merchandise without assistance. ***Video kiosks*** are video machines that display merchandise visually so customers can see merchandise in a moving format. For example, a video might be shown of a fashion show in a clothing department, or a video demonstrating different ways to tie scarves might be placed in an accessory department.

USE OF DESIGN ELEMENTS IN DISPLAYS

The elements of design, discussed in Chapter Eight, are used in designing effective displays. In display design, line is used to direct the attention of the person viewing the display. Line may be applied through arrangement of displayed items, the outlines of displayed items, or background materials selected. Line may also be used to create an impression or mood. For example, straight lines usually create an impression of stiffness or rigidity. Curved lines tend to create an image of freedom or movement. The direction of the line used in a display is also an important consideration. Vertical lines establish an impression of height. Diagonal lines tend to be used in dramatic presentations. Horizontal lines provide an impression of width.

Shape or form is used to describe display units and the form of items placed in displays. It is important to combine items in a display that have complementary shapes. It is also important to consider the shape of a display unit when considering which merchandise to display. In some cases, display units or areas have no particular shape. Such display units have a floor but no sides, background, or ceiling.

Color is used in displays to attract attention. Specific colors also create certain impressions. For example, blue creates an impression of calmness and quiet. Yellow projects warmth and happiness. Red is dramatic and indicates strength. Violet represents quality and richness. It is important to consider the use of color schemes when creating displays. Commonly used color schemes are described in Chapter Eight.

Space is related to the size and weight of objects. Space is sometimes defined as the background against which forms or shapes are seen. Size is usually discussed in terms of relationships between objects. When designing a display, the sizes of displayed items and the display space are compared to ensure that adequate space is allowed.

Texture refers to the look and feel of an item's surface. Usually, texture is identified by touching an object. However, because people are familiar with the textures of many materials, textures can also be recognized by simply looking at objects. Textures used in displays are often selected to set the stage for presentation of merchandise. In some cases, the textures of props may be selected to contrast with the merchandise displayed. For example, velvet is often used to display jewelry because the softness of velvet contrasts with the hardness of the jewelry. Display specialists may choose to work with the natural textures of objects, or they may apply artificial textures to objects. Sometimes, paints and inks may be used on props and background materials to simulate desired textures for a particular look.

USE OF DESIGN PRINCIPLES IN DISPLAYS

The principles of design are discussed in Chapter Eight in relation to fashion design. These principles are also applied when designing displays. All parts of a display should be planned so that an impression of oneness or completeness is created. This impression of all components going well together is called unity or harmony. In an effective display, the intended idea is clear and no parts of the display are overdone. Objects that are used together or associated with each other should appear together to create harmony. For example, autumn leaves might appear in a back-to-school display.

Rhythm is a pattern of movement. Rhythm may be created through the use of repetition. Repetition is used when several of the same item are displayed. Several exact duplications of items may be presented together, or different sized items may be alternated to create rhythm. Repetition is discussed further in the following section on basic display arrangements. Gradation may also be used to create harmony and rhythm. Gradation involves the variation of an element by degrees. For example, a background including a road that becomes smaller in the distance suggests depth and draws the viewer into the display. Contrast may also be used to create harmony and rhythm. ***Contrast*** involves showing opposite or complementary features in the items on display. For example, complementary colors may be used in a display and if applied appropriately, will create rhythm and harmony.

Emphasis is achieved when attention is drawn to a certain part of a display design. The principle of emphasis is also sometimes called ***dominance***. Dominance may also be created by displaying an item as a focal point of a display. A ***focal point*** or ***center of interest*** is a single item, such as a mannequin, that appears as the dominant feature of a display. A focal point may also be created through use of design elements. For example, a focal point may simply contrast in color or shape with surrounding objects.

Proportion refers to the relationship of parts to each other and to the design as a whole. Proportion also involves the relationships of objects to the space around them. If a display area and props are too large compared to the merchandise displayed, the display will not achieve its purpose. If the display area and props are too small for the merchandise, the merchandise may appear crowded. Display specialists usually find it easiest to begin arranging a display at the center of the display floor and arrange items or display parts backward and forward. Considering the vertical space in thirds helps the display specialist to apply the principle of proportion.

Balance involves being equal, usually in weight or quantity. Balance refers to arrangement of design parts to create a feeling of equilibrium. Formal balance, sometimes called symmetrical balance, involves the weight being concentrated in the center of a display. The design is the same on each side of the design center. Items do not have to be exactly identical on each side of the center to be consider symmetrical. However, the weight on both sides of the design center should be the same. Formal balance is usually not considered to be as interesting as informal balance. Informal balance, sometimes called asymmetrical balance, is a more casual design. The design is balanced but is different on each side of the design center.

BASIC DISPLAY ARRANGEMENTS

Several basic display arrangements are commonly used. A ***single-unit arrangement*** is a presentation of only one unit with minor details. Usually the merchandise is supported by a single prop. A dress and basic accessories displayed on a mannequin is an example of a single-unit arrangement.

Repetition is a display arrangement involving repeated design. Repetition arrangements are created quickly by placing one kind of merchandise in rows stacked or hung on top of each other. Spacing and direction of the merchandise is repeated over and over. Placement of repetition arrangements in high-traffic areas increases their effectiveness.

A ***step arrangement*** involves a gradation of height. Such displays simulate a staircase. Merchandise may be displayed on pedestals or boxes of varying heights and arranged in increasing heights. Shoes are often displayed in step arrangements.

A ***zigzag arrangement*** is a variation of the step arrangement. It involves placing merchandise in a pattern following a zigzag line. The arrangement does not require equal height and distance between each level of merchandise.

A ***line arrangement*** involves placing items of merchandise and props in the path of a straight or curved line. Line arrangements are most frequently used when there are only a few units in a display. Line arrangements include the ***S-curve*** (a curving line that zigzags from left to right), ***crescent curve*** (a line that curves in the shape of a crescent), and a ***reverse curve*** (a line that curves in the opposite direction of the crescent curve).

Radiation involves arranging related items in direct lines from a central object or space. The purpose of a radiation arrangement may be to direct the viewer's vision toward the center of the display or away from the center. A ***pyramid arrangement*** involves arranging items from a broad base and adding items so they rise toward a point. Pyramid arrangements are most often used to display small merchandise such as canned goods or cosmetics.

SIGNAGE USED IN DISPLAYS

The term ***signage*** refers to the use of signs in retail stores to present a merchandise theme, introduce a fashion trend, provide the background of a product, explain why a product is desirable, and emphasize other important points. Each retail store has its own philosophy about the use of signs. ***Descriptive signs*** are signs used to describe merchandise. Signs should be compatible with the look and theme of displays.

Signs should be professionally prepared. Some large retail stores have sign shops in their stores where professionals prepare signs. The most recent trend in signage is for stores to contract with professionals outside the store to prepare signs. This arrangement prevents the expense of hiring full-time professionals to prepare signs. In addition, some manufacturers provide professionally prepared signs for retail stores who sell the manufacturers' merchandise. Exclusive shops tend to use less signage than other retail stores.

An effective sign is informative, is accurate, is appropriate for the display, follows a set pattern, and does not contain too much information. The information provided on a sign may include the name, the price, and important descriptive information. For example, a sign describing children's overalls may include phrases such as "sizes 2 to 8" and "adjustable straps" in addition to the price and item name.

The overall look of a sign should be compatible with the type of display in which it is used. If the look of a particular display is casual, the lettering on the sign and the colors used on the sign should complement the overall look of the display. A large display may require a large sign while a small display requires a smaller sign. All of the signs in a department or area should complement each other to create a pattern. It is important to visualize each department or area in a store as a customer views it in order to create an appropriate image for the store. A sign should not contain too much information because the intended message becomes lost among unnecessary words. Providing a limited number of well-chosen words and phrases on a sign is better than offering too much information.

FIXTURES USED IN DISPLAYS

Fixtures are items constructed to support and display merchandise. There are various types of fixtures. Stands are used to raise various types of merchandise to eye level. A ***basic display stand*** can be made of metal, wood, or plastic; has a stable, circular base; and has adjustable extensions so it may be raised to different levels. There are many different attachments and tops that screw onto basic display stands for use in displaying various types of merchandise. The following types of attachments may be used with a basic display stand to display merchandise:

- T-top – The ***T-top*** is a straight utility bar attached perpendicular to the display stand. Items such as fabric or scarfs may be draped over the bar for display.
- garment top – The ***garment top*** is curved downward and displays one sweater, blouse, dress, jacket, or other garment.
- lingerie top – The ***lingerie top*** is curved upward on both ends to keep slips and gowns from sliding off the bar. Shoulder strap handbags may also be displayed on a lingerie top.
- shoe top – The ***shoe top*** consists of a flat piece of metal and steel pins and is used to display shoes. The shoe top attachment may be tilted at different angles.

In addition to the basic display stand, there are many other types of fixtures used to display apparel. These fixtures are usually used within clothing departments to display multiple apparel items. Some of the most commonly used fixtures are as follows:

- T-stand – The ***T-stand*** looks like a basic display stand with a T-top attached. T-stands are used .on the aisle or in the front of a department. No less than eight items and no more than twelve items should be displayed on one T-stand. Only one type of merchandise should be placed on the stand at once.
- tent costumer – The ***tent costumer*** is a variation of the T-stand. It differs from the T-stand in that the bar attached to each side of the top of the stand is angled downward and has pegs to hold garment hangers. A tent costumer should hold the same number of garments as there are pegs.
- tri-rack – The ***tri-rack*** is a display that can be approached from all angles and consists of three sides for display of one type of garment in various colors. A glass top may be added to a tri-rack to show an example of the garment item hanging on the racks or to hold signage.
- quad rack – The ***quad rack*** is available in different heights. The taller units allow two tiers of garments to be hung, one over the other. A multi-shelf Plexiglas™ case can be added to the quad rack to display folded merchandise such as men's shirts. The quad rack is used to display men's and women's clothing and is especially useful for separates.
- S-rack – The ***S-rack*** is adjustable and may be used in an S-shape or in a circular formation around a column. One, two, or three tiers of garments can be hung over each other. Waterfall brackets are sometimes attached to an S-rack to hang handbags, belts, or jewelry. ***Waterfall brackets*** are angular attachments that project outward with hooks that separate and hold items.
- pinwheel rack – A ***pinwheel rack*** consists of three half-circular units staggered in heights of 78", 66", and 54". The pinwheel rack is especially useful for displaying groups of coordinated garments.

A variety of other fixtures are used to display merchandise and related information. The following items are commonly used in apparel and textiles retail businesses:

- easels – ***Easels*** are three-legged stands that display items perpendicular to the display area. Easels may be made of metal, plastic, wood, rubber, or wire. They may be used to display merchandise or signage.
- millinery heads – ***Millinery heads*** are fixtures designed to display hats. They may be adapted for used in displaying necklaces and scarfs. Some millinery heads resemble the human head while others are more abstract. A millinery head has a stand to support the head.
- forms – Forms are designed to replicate the human body or parts of the body. They are designed to display women's, men's, and children's clothing. Some forms are full-figured. These forms are often called ***mannequins***. ***Appendage forms*** are reproductions of arms, hands, or legs used to display items such as

gloves, shoes, and hosiery. Some forms include only the torso without heads or appendages (arms and legs). Women's blouses and men's shirts and jackets are often displayed on these forms.

- platforms – As previously described, a ***platform*** is an elevated stage on which items are displayed. The platform serves to raise the merchandise for viewing and prevents handling of merchandise.
- displayers – ***Displayers*** are hung as panels from the ceiling to serve as the background for a display or to separate groups of merchandise.
- set-pieces – ***Set-pieces*** include display items such as small statuettes, foliage, or commonly used objects such as telephones. Set pieces serve as props in carrying out a display theme.

Points to Remember

- Display is a nonpersonal physical representation of merchandise or ideas at the point of sale.
- Visual merchandising refers to various methods used to make a business attractive and efficient in selling merchandise.
- The responsibility for creating displays is assigned to different employees. In small businesses, employees not specifically trained in visual merchandising may have display responsibilities. In larger stores, employees are hired who specialize in display.
- Window displays promote sales by showing customers available merchandise. The major categories of window displays are selling displays and prestige displays.
- Various types of window displays include single-category displays, campaign window displays, single-promotion displays, sale displays, line-of-goods displays, and mass displays.
- Responsibilities related to window displays are assigned by different methods including the departmental method and rotation method. Most stores change their window displays once each week.
- Types of windows used for displays include the open window, closed window, and semi-closed window.
- Components used in window displays include merchandise, functional props, decorative props, structural props, background, floor covering, and lighting.
- Interior displays are used in combination with window displays and advertising to create image and personality for a business. Interior displays should be located where customers will see them.
- Types of interior displays include showcase displays, counter displays, displays on platforms, displays in shadow boxes, environment displays, island displays, displays in free-standing units, hanging displays, point-of-purchase displays, self-selection displays, and video kiosks.
- The elements and principles of design are used in designing effective displays.
- Various arrangements may be used in developing displays including the single-unit, repetition, step, zigzag, line, S-curve, crescent curve, reverse curve, radiation, and pyramid arrangements.
- Signs should be professionally prepared. An effective sign is informative, is accurate, is appropriate for the display, follows a set pattern, and does not contain too much information.
- Various types of fixtures are used in constructing displays. Fixtures are items constructed to support and display merchandise.

Words to Know

appendage forms
basic display stand
campaign window displays
center of interest
closed window
contrast
counter displays
crescent curve
point-of-purchase displays
POP displays
prestige displays
pyramid arrangement
quad rack
radiation
related displays
repetition

decorative props
departmental method
descriptive signs
display assistant
display director
displayers
display specialist
dominance
easels
environment displays
fixtures
floodlighting
focal point
freelance display specialist
free-standing display units
functional props
garment top
gondolas
hanging displays
institutional displays
interior displays
island displays
line arrangement
line-of-goods displays
lingerie top
mannequins
mass displays
millinery heads
open window
pinpointing
pinwheel rack
platforms
reverse curve
rotation method
sale displays
S-curve
self-selection displays
selling displays
semi-closed window
series displays
set-pieces
shadow boxes
shoe top
showcase displays
signage
single-category displays
single-promotion displays
single unit arrangement
special event displays
spotlighting
S-rack
step arrangement
structural props
tent costumer
trimmer
tri-rack
T-stand
T-top
video kiosks
visual merchandising
visual merchandising director
waterfall brackets
zigzag arrangement

Questions for Review

1. How do display and visual merchandising differ?
2. What are examples of jobs available for people who specialize in display?
3. What are the differences in the two major categories of window display?
4. What are the differences in the various types of window displays?
5. What are the advantages and disadvantages of the different types of windows to retailers?
6. What are the major components of window displays?
7. How are responsibilities related to window displays assigned to employees?
8. What are the three major objectives that planners of interior displays try to achieve?
9. What are examples of good locations for interior displays?
10. What are the major types of interior displays? How are they used?
11. How are design elements and principles applied in the development of displays?
12. How do the various display arrangements differ?

13. What characteristics should a display sign have in order to be effective?

14. How are fixtures used in arranging displays?

19

Use and Care of Sewing and Pressing Equipment

ESSENTIAL ELEMENTS

- Demonstrate appropriate use and care of sewing or pressing equipment.(q8B)
- Demonstrate pressing procedures.(q10E)

OBJECTIVES TO ACHIEVE

- Describe types and uses of conventional sewing machines.
- Explain types and uses of industrial sewing machines.
- Contrast the functions of various types of sewing machine attachments.
- Analyze common problems that occur when using sewing machines and the care and maintenance required for sewing machines.
- Identify miscellaneous sewing equipment and tools and their functions.
- Describe different types of pressing equipment and general procedures for use of pressing equipment.

The cost of an industrial sewing machine varies from several hundred to several thousand dollars. Therefore, the cost of all machines, other pieces of equipment, and tools in an apparel manufacturing plant or custom sewing business amounts to a sizeable investment. This chapter identifies and describes the tools and equipment used by apparel manufacturers, custom sewers, dressmakers, tailors, and alterationists. It also describes the uses, functions, and care of these tools and equipment. Taking care of tools and equipment and developing good working habits are as important as sewing skills.

Regardless of an employee's assigned tasks, it is important that textiles and apparel industry employees keep their work areas relatively neat and orderly. Good work habits result in efficient use of time, assist with energy management, and protect equipment and tools. It is also important for each employee to become mentally organized. Thinking ahead helps ensure that all supplies and equipment are ready when needed.

SEWING MACHINES

Sewing machines come in conventional and industrial models. Designers, custom sewers, and alterationists may use either type of machine to complete their work. Employees working in apparel manufacturing plants use industrial sewing machines.

Types of Conventional Sewing Machines

Conventional sewing machines are sewing machines designed for use by home sewers or people in the business of custom sewing, alterations, or designing. Conventional sewing machines come in the following four basic types: straight stitch, zigzag stitch, automatic stitch, and electronic or computerized. A ***straight stitch sewing machine*** stitches in straight lines by feeding fabric forward and backward. Some straight stitch machines have attachments for making buttonholes or sewing a zigzag stitch.

A ***zigzag sewing machine*** makes both straight stitches and zigzag stitches without any special attachments. An ***automatic stitch sewing machine*** can make straight, stretch, chain, zigzag, and decorative stitches with built-in discs or pattern cams. A ***cam*** is a metal disc of irregular shape mounted on a rotating shaft as part of a sewing machine's internal mechanisms, and it is used to produce zigzag and decorative stitch patterns.

Electronic sewing machines or ***computerized sewing machines*** can complete the same tasks as automatic stitch machines; however, they are equipped with programmable (computer) electronics. The operator may enter any stitch variations desired into the machine's programmable memory, and the machine automatically stitches the programmed stitch variations. Programmable sewing machines are sometimes capable of creating monograms and more than 100 decorative stitch patterns automatically.

Use of Conventional Sewing Machines

Every employee who operates a sewing machine should be familiar with the parts of the sewing machine and how they function. The sewing machine parts affect the stitches produced and therefore the final quality of the garments produced. Each domestic sewing machine is slightly different. However, all sewing machines have basic parts that can be identified although they may be found in slightly different locations on different machines. Figure 19.3 illustrates a basic conventional sewing machine. The ***head*** of the sewing machine is the main part of the machine, excluding the ***bed*** (the flat base of the machine that contains the bobbin and bobbin case).

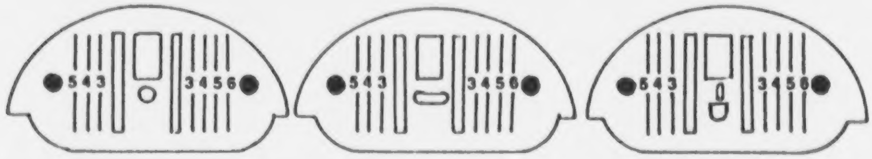
Although sewing machines are very similar and produce about the same results, different models and brands are not exactly alike. It is important to be thoroughly familiar with the sewing machine that is used. Operators should know how to start stitching, control the machine's speed, and stop smoothly at the appropriate locations. Machine speeds are controlled with foot controls or knee controls.

Forming Stitches – Stitches are formed by the sewing machine when upper thread (threaded through the needle) links with the lower thread (wound on a bobbin). A ***bobbin*** is a small metal or plastic cylinder that holds thread and is placed in the lower part of the sewing machine under the feed. The thread from the bobbin locks with the needle thread to make an interlocked stitch. This stitching process occurs as the following steps take place:

- The needle moves through the fabric taking the top thread into the bobbin area.
- The top thread forms a loop as the needle rises.

- The ***shuttle hook***, a hook that rotates in the bobbin area, catches the thread loop.
- The shuttle hook carries the thread loop around and under the bobbin case.
- The thread loop slides off the shuttle hook as it rotates and links with the bobbin thread.
- The top and bottom threads are pulled up together and are set into the fabric as a lock stitch.

As the needle moves toward the bobbin area to form a stitch, it passes through an opening in the throat plate. The ***throat plate*** or ***needle plate*** is a removable metal plate attached to the base of the sewing machine directly under the needle bar. There are openings in the throat plate for the feed to move up and down as it pulls the fabric under the presser foot. On some machines, the throat plate has etched lines at several widths from the needle. These lines serve as seam guides so that stitching can be placed evenly at specific widths. A different type of throat plate is used for zigzag stitching than for straight stitching. The zigzag throat plate has a larger opening for the needle since the needle moves from left to right for zigzag stitching. In addition, there is a special throat plate used to chain-stitch. Chain stitching is stitching made when the top thread forms a continuous row of stitches. Figure 19.1 illustrates three types of throat plates.

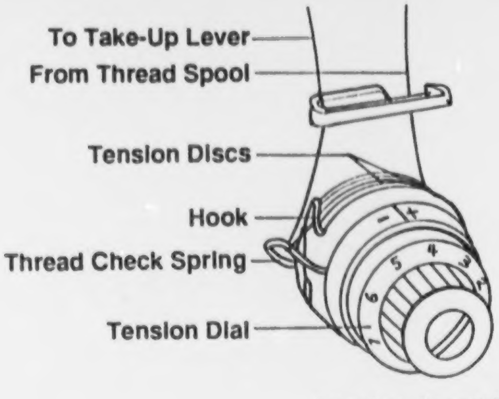


Straight Stitch Throat Plate **Zigzag Throat Plate** **Chain Stitch Throat Plate**

Figure 19.1

Adjusting Tension – To make a perfect stitch, the tension on the needle thread and the bobbin thread must be correctly balanced. Tension is controlled by thread guides and tension discs. ***Thread guides*** are small hooks attached to the sewing machine that hold and guide the thread as it moves from the thread spool to the needle. ***Tension discs*** are two discs that apply pressure to the thread to help control the thread's flow as stitches are formed. As the machine is threaded, the thread is placed between the two discs. The tension discs are often located behind a tension dial on the front of the sewing machine. The ***tension dial*** regulates the tension of the tension discs on the needle thread (top thread). The combination of tension discs, tension dial, special hooks, and a spring are referred to as the ***tension assembly***. Parts of the tension assembly are illustrated in figure 19.2. The top thread tension should be adjusted when the presser foot is down since the tension discs are open when the presser foot is up.

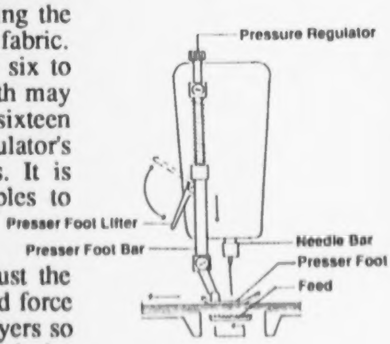
The top thread tension and bobbin tension should be balanced so that the linkage of the two threads occurs at the appropriate place. When the tension is properly balanced, the linkage of the top thread and the bottom thread should lie toward the center of the fabric layers. When the top tension is too tight, the linkage of the top thread and bottom thread will appear on the top layer of fabric. When the top tension is too loose, the linkage of the two threads will lie toward the bottom layer of fabric. The tension dial is used to adjust the top thread tension by increasing or decreasing the amount that the tension discs press against each other and against the top thread. If stitch tension problems cannot be corrected by adjustments to the tension dial, the bobbin thread tension may be adjusted. Bobbin thread tension is corrected by turning an adjustable tension screw found on the bobbin case. The ***bobbin case*** is a small compartment that holds the bobbin. Adjustments to the bobbin tension should be made by turning the adjustable tension screw very small amounts.



Tension Assembly

Figure 19.2

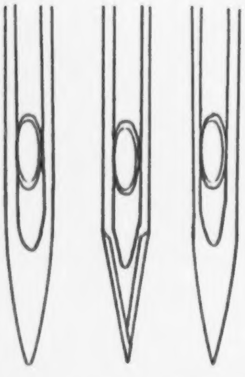
Adjusting Stitching – The ***stitch regulator*** or ***stitch length control*** determines the length and direction of the stitch. The ***feed*** is the part of the sewing machine under the needle that moves the fabric under the presser foot and advances the fabric one stitch at a time. The feed creates an upward force. The distance the feed moves the fabric for each stitch is changed by adjusting the stitch regulator. The stitch length must be adjusted for different weights of fabric. For machine basting or heavy fabrics, stitch length may be adjusted to six to eight stitches per inch. When sewing medium weight fabrics, stitch length may be set at ten to fourteen stitches per inch. The smallest stitch length, sixteen stitches per inch, is used for very sheer, delicate fabrics. The stitch regulator's numbering system is different for different types of sewing machines. It is important to check the manufacturer's instructions or make test samples to determine the number of stitches per inch produced by each setting.



When sewing different weights of fabric, it is also necessary to adjust the pressure of the presser foot on the fabric. ***Pressure*** refers to the downward force placed on the fabric by the presser foot. This pressure holds the fabric layers so that they move evenly together during stitching. This adjustment is made by adjusting the ***pressure regulator***. There are different types of pressure regulators including a dial on the side of the machine, a push bar on top of the machine, a dial on the top of the machine, and a screw type regulator. Stitch width may also be regulated. The ***stitch width control*** regulates the width of zigzag stitching and positions the needle for straight stitching. On most machines, the ***needle position control*** regulates the position of the needle from left to center to right.

As described in Chapter Nine, backstitching involves sewing back and forth over the same row of stitching or sewing several stitches in one spot. Backstitching is used to reinforce the ends of plain seams and in mending. Some machines have an automatic backstitch mechanism that allows the machine to automatically create a backstitch. Most machines have a button or lever, called a ***reverse stitch control***, that allows the operator to stitch backward.

Using Sewing Machine Needles – There are various types and sizes of sewing machine needles. Sewing machine needles are selected based on the type and weight of the fabric being sewn. Five basic types of sewing machine needles are sharp, ballpoint, wedge-shaped, twin, and triple. A ***sharp needle*** or ***general purpose needle*** has a sharp point and is used to sew woven fabrics. A ***ballpoint needle*** has a slightly rounded tip and is used when sewing knits and stretch fabrics. The rounded tip allows the needle to slip between fabric yarns. A ***wedge-shaped needle*** has a wedge-shaped point and is used to sew leathers and vinyls. A ***twin needle*** or ***double needle*** is used for decorative stitching. It consists of two



needles attached at the point where they are inserted into the sewing machine. A ***triple needle*** is similar to a twin needle but consists of three needles attached together.

A sewing machine needle is inserted into the needle bar so that the grooved side faces the direction from which the needle is threaded. The ***needle bar*** is a bar suspended from the head toward the base of the machine. It moves up and down to form stitches. Procedures for inserting sewing machine needles are outlined in the manufacturer's instructions for each sewing machine. Blunt, burred (rough), or bent needles should be replaced to prevent stitching problems and harm to fabric. Before a needle can be inserted into the sewing machine, the needle clamp screw must be loosened. The ***needle clamp screw*** is a screw that projects horizontally from the needle bar. Although procedures for inserting needles vary according to different sewing machines, the most common procedure for needle insertion is as follows:

- Loosen the needle clamp screw.
- Push the needle up into the clamp as far as possible.
- Make sure that the grooved side of the needle faces toward the last thread guide.
- Tighten the needle clamp screw.

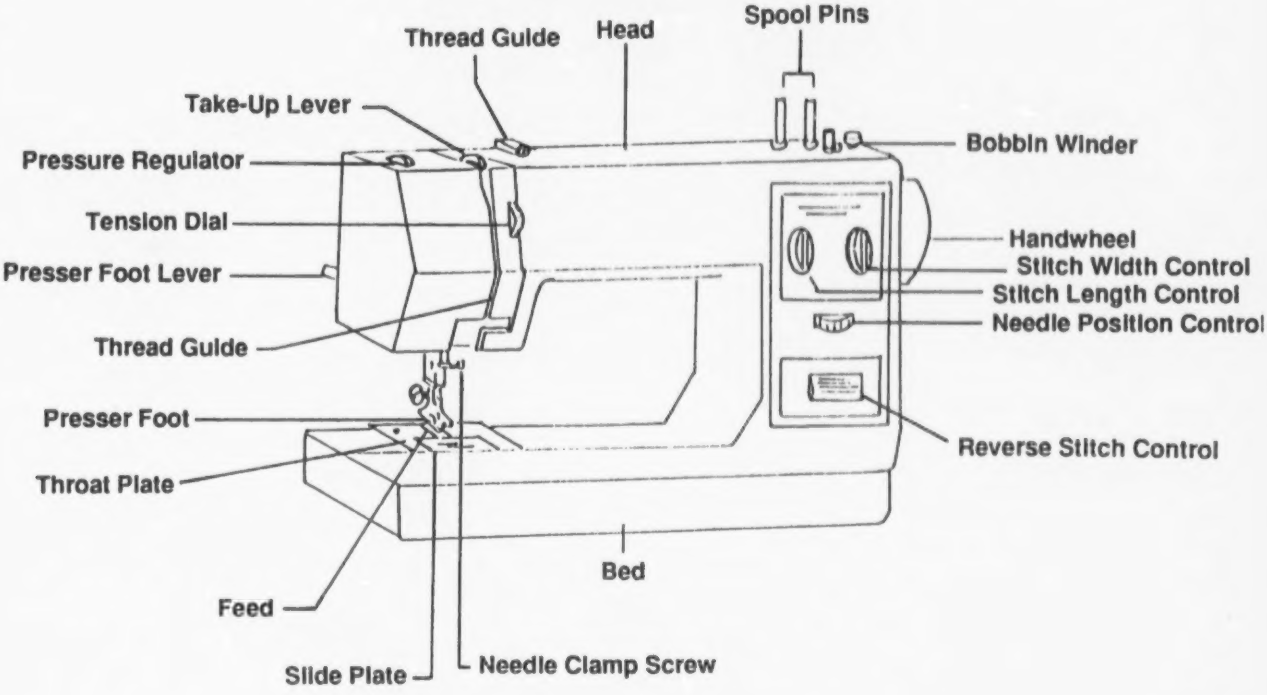


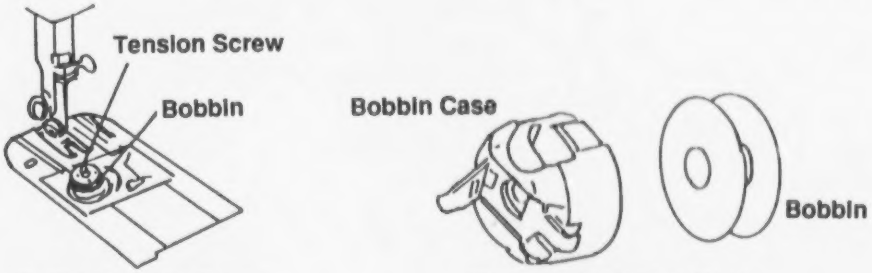
Figure 19.3

Threading the Machine – Because incorrect threading is often the cause of poor stitching, it is important to learn how to thread the sewing machine properly and wind the bobbin evenly. The presser foot should be raised while threading a sewing machine in order to allow the thread to move easily through the tension discs. The ***presser foot*** is an attachment that holds the fabric against the feed during stitching. The presser foot is raised by lifting the ***presser foot lever***, a lever on the back of the sewing machine. The take-up lever should be at its highest point during threading so that the needle will be easy to reach and will not become unthreaded when stitching begins. The ***take-up lever*** is a part of the sewing machine that controls the amount of thread pulled from the top thread spool for each stitch. The take-up lever moves up and down as each stitch is made.

Different machines have different numbers and types of thread guides. The thread is threaded through each of the thread guides. The spool of thread is placed on the sewing machine's ***spool pin***, a plastic or metal pin projected from the head of the machine. To thread the sewing machine, the thread is passed through a thread guide near the top left of the sewing machine, passed through the tension discs assembly, passed through another thread guide and into the take-up lever, brought down and passed through about two more thread guides, and inserted into the needle's eye in the proper direction. The location of the last thread guide on the machine indicates which direction to thread the needle. For example, if the thread guide is on the left, the needle is threaded from the left. If the thread guide is on the front of the needle bar, the needle is threaded from the front. The last thread guide may also be on the right or on the back of the needle bar.

Preparing the Bobbin – There are many different devices for winding thread onto bobbins. On most sewing machines, bobbin thread is wound on the bobbin by use of a bobbin winder. The ***bobbin winder*** may be on the top, front, or side of the machine. It includes a place to attach the bobbin and winds thread from the spool to the bobbin. The thread from the spool on the spool pin passes through thread guides and a tension disc which lead the thread to the bobbin winder. It is important that thread is wound evenly on the bobbin. Uneven winding of a bobbin can result in uneven stitch tension.

There are different types of bobbin cases in different types of sewing machines. In some sewing machines, the bobbin case is covered by a ***slide plate***, a metal plate that slides forward to open the bobbin area. Different types of bobbins are designed for use in different sewing machines. A ***drop-in bobbin*** is used in a sewing machine that has a built-in bobbin case. A ***built-in bobbin case*** is one that is not removed from the machine. A special drop-in bobbin is used in a machine that has a bobbin winding device built into the bobbin case. With this type of machine, the upper portion of the sewing machine is threaded and the bobbin rotates and fills as the needle moves up and down. A ***special drop-in bobbin*** is made of clear plastic and usually the top half of the bobbin is larger than the bottom half. A ***removable-case bobbin*** is used in a machine that has a removable bobbin case. The ***removable bobbin case*** is a small metal compartment that must be lifted out of the machine in order to remove the bobbin. Figure 19.4 illustrates two types of bobbin cases.

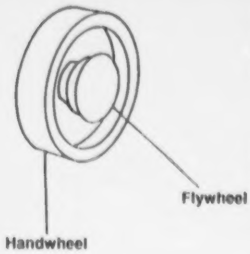


Built-In Bobbin Case

Removable Bobbin Case

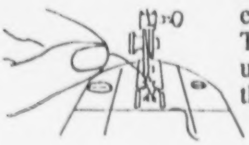
Figure 19.4

On some machines, the flywheel must be loosened to stop the needle and take-up lever from moving up and down as the bobbin is wound. The ***flywheel*** or ***stop motion screw*** is located on the inside center of the sewing machine's hand-



wheel. The ***handwheel*** is a wheel on the right side of the machine that controls the movement of the take-up lever; it can be turned by hand to raise or lower the needle. The handwheel is held and the flywheel is turned to loosen the flywheel.

After preparing the bobbin, the bobbin is placed inside the bobbin case. The procedures used to thread the bobbin case are different for each different type of sewing machine. Therefore, it is important to follow the manufacturer's instructions to learn correct bobbin threading procedures.



Raising the Bobbin Thread – After placing the filled bobbin in the bobbin case, the top thread (which has been threaded through the needle's eye) is held in the left hand and the handwheel is turned with the right hand until the needle enters the bobbin area and comes back up, bringing the bobbin thread with it. The bobbin thread is looped over the needle thread. The needle thread is pulled up to bring out more of the bobbin thread and its loose end. The two threads are then passed under and behind the presser foot in preparation for stitching.

INDUSTRIAL SEWING MACHINES

Employment opportunities at apparel manufacturing plants require sewing machine operators to use fast, power-driven, ***industrial sewing machines***. These machines are heavier and sew much faster than conventional machines. Industrial sewing machines are used by manufacturing plants, tailoring and dressmaking shops, drapery workrooms, alteration workrooms, and clothing maintenance businesses. Trained industrial sewing machine operators can find employment even though they have had little work experience. Any person who has sewing skills and can operate industrial sewing machines can easily learn specific sewing techniques.

Industrial sewing machines are usually either lock stitch or chain stitch machines. Stitches formed by lock stitch machines look the same on both sides of the work and resemble stitches made by conventional sewing machines. Stitches formed by chain stitch machines look the same on the top as those formed by the lock stitch machines but resemble a chain on the bottom.

Different industrial sewing machines produce various types and classes of stitches. In apparel manufacturing, these stitches are often identified by numbers. For example, type 100 stitches are formed with a single thread that is threaded through the eye of the sewing machine needle. No bobbin is used to produce type 100 stitches which are called chain stitches. Chain stitches are easily removed by simply pulling the end of the thread from the last stitch formed. Since the stitches are formed with one thread, an entire line of stitching can be easily removed by pulling the end thread. The 300 class stitches, also called lock stitches, single needle stitches, and plain stitches, are the most commonly used stitches in apparel manufacturing. A sewing machine must have a bobbin in order to produce lock stitches.

Types of Lock Stitch Machines

Single-Needle Lock Stitch Machine – ***Lock stitch sewing machines*** use at least two threads to produce stitches. The top thread goes through the needle, and the bottom thread is wound on a bobbin. Figure 19.5 provides an illustration of a basic lock stitch industrial sewing machine. The ***single-needle lock stitch machine*** is the most common industrial sewing machine. It is used to stitch the seams on most garments. The stitches will not ravel easily and are less elastic than the chain stitch.

Multi-Needle Lock Stitch Machine – A ***multi-needle lock stitch machine*** uses more than one needle, tension assembly, and bobbin. On some machines, several needles are positioned side by side, and the same number of bobbins as needles are used. The machine produces several parallel rows of stitching at one time. Each needle forms one row of lock stitches. The two-needle lock stitch machine sometimes has a folder for making flat-felled seams, folded seams used on shirts and jeans.

Zigzag Lock Stitch Machine – Lock stitch machines can have as many as thirty-six needles for making many rows of stitching in one operation. They can be used with attachments to produce smocking designs, embroidery, and various decorative stitches. The ***zigzag lock stitch machine*** is threaded similarly to the single-needle lock stitch machine. Zigzag stitches are made by both forward and side-to-side motions and can be adjusted in length or width. In sewing, the single-needle lock stitch machine and zigzag lock stitch machines differ in the way they turn corners. The needle in a zigzag machine must be at its highest point to turn a corner. The needle in a single-needle lock stitch machine must be at its lowest point.

Types of Chain Stitch Machines

Chain stitch sewing machines produce a more elastic stitch than a lock stitch. Chain stitches ravel easily and may be used for seams that do not receive much stress. They are also used for basting, tacking, and sewing on buttons.

As mentioned previously, a bobbin is not used in a chain stitch machine. Instead, a ***looper***, a hook with an eye and thread channel in it, is used. The needle moves up and down while the looper moves back and forth. The looper may or may not be threaded.

Single-Thread Chain Stitch Machine – The ***single-thread chain stitch machine*** has few moving parts and uses one spool of thread. The looper does not carry a thread but moves in various directions to produce a simple chain of stitches. These chain stitches ravel easily.

Two-Thread Chain Stitch Machine – The ***two-thread chain stitch machine*** produces seams that are fairly strong and flexible because a second thread is used. Parallel rows of stitching can be produced when more than one needle is attached to the machine. This machine may be used to make flat-felled seams and is often used to sew sleeves and trouser legs.

Bottom Covering Chain Stitch Machine – A ***bottom covering chain stitch machine*** may have two, three, or four needles. Each needle has a needle thread. These threads are chained together on the underside of the fabric being sewn.

Top-and-Bottom Covering Chain Stitch Machine –The ***top-and-bottom covering chain stitch machine*** carries one more thread than the bottom covering chain stitch machine uses. A device carries the thread and weaves it among the rows of stitching on the top side of the fabric. This type of chain stitching is used on knitted underwear, swimwear, and foundation garments.

Serger – The serger is used to trim and seam all weights and types of fabrics. The ***serger***, also known as the ***overlocker*** or ***overedge machine***, trims the edges of the seams and then overcasts the edge of the fabric with a chain stitch to prevent raveling. When serging is used to overcast and seam at the same time, more than one thread is used. Sergers may use as many as six threads, depending on the type of seam being made. Some sergers will finish the fabric edge and at the same time make an additional row of stitching. This stitching is referred to as a row of safety stitching, which reinforces the stitching on the fabric edge.

Threading a serger is a time-consuming process requiring tweezers and threading wires. The serger is easy to operate but requires a skilled operator because of its speed. The plies of fabric must be kept straight and even because most sergers have trimming attachments that trim the edges evenly before they reach the needle. Sergers are often used on knits and stretchy fabrics.

Blind Stitch Machine – The ***blind stitch machine*** produces a stitch that is almost invisible on the outside of the garment. This machine is used for hemming. It uses one thread and a curved needle that moves from side to side to make a stitch similar to a handmade hemming stitch. The needle goes only partly through the fabric to which the hem is being attached. Blind stitch machines may be adjusted for fabrics of different weights since the thickness of fabrics vary. The adjustment is made by changing the position of the ridge over which the fabric passes. If the ridge is set too low, the needle does not catch the fabric, and the hem is not sewn. If the ridge is set too high, the needle goes through the outer fabric, allowing the stitches to show on the right side.

Types of Automatic Sewing Machines

Various types of automatic machines are used to complete specific tasks. To operate an automatic machine, the fabric is placed in a clamp on the machine and the machine is started. The clamp moves the fabric in a programmed pattern and stitches are sewn. The machine automatically stops and the fabric is released.

Lock Stitch Tacker – The ***lock stitch tacker*** is a machine that is used to make small stitching patterns. Sometimes these stitching patterns are used to reinforce seams or stress points or to attach small pieces of fabric such as loops or labels. Different models of lock stitch tackers are available that are used for various tasks such as sewing on buttons and snaps.

Buttonhole Machine – The ***buttonhole machine*** can be either an automatic lock stitch machine or a chain stitch machine. It is equipped to sew, cut, and trim the threads on buttonholes. After the fabric is clamped into the machine and the machine is started, the machine automatically performs its functions. The machine can make one buttonhole at a time or an entire row of buttonholes.

The length of the buttonhole and the width of the bight can be adjusted on each side. The ***bight*** is the width of the stitch or the distance the needle moves from left to right when making a stitch other than a straight stitch. The space between the two rows of zigzag stitches and the number of bar tack stitches at each end of the buttonhole can also be adjusted.

Buttonholes and threads can be cut automatically. The buttonholes are cut by a cutting knife that is located behind the needle bar. Most machines also have a lever to stop the knife from cutting if an uncut buttonhole is needed. Straight buttonholes are usually cut after the buttonhole is finished and are called ***cut-after buttonholes***. Some machines cut the buttonhole first and then stitch around the edges of the cut. These are called ***cut-before buttonholes***. Unless the fabric has considerable body, it may gather and pleat during stitching if cut first.

Some buttonhole machines have a button to stop the machine at any point in the cycle. The machine may be stopped if the thread breaks or if any other problem develops. When the stitching is started again, the machine will continue from the same spot where it stopped. The buttonhole machine should be tested by sewing on a scrap of fabric. A buttonhole can be started on a scrap of fabric and stopped at the same point where stitching on the original piece of work was stopped. The work can be placed back in the machine and the buttonhole finished without any indication that the machine was stopped.

Button Sewer – The ***button sewer*** automatically attaches buttons, snaps, hooks, and eyes. The button sewer is either a lock stitch or a single-thread chain stitch machine that stitches a zigzag pattern in practically the same place instead of moving the material forward. The machine will sew a pre-set number of stitches a pre-set distance apart. The button sewer can be adjusted to sew on either two-hole buttons or four-hole buttons. The button sewer also will sew on buttons that vary in size and shape and it has a special clamp to hold shank-type buttons.

The button sewer does not have a feed mechanism. Instead, it has a raised or cylinder bed to make it easy to reach any area of a garment. The work is placed under the clamp and the button is placed in the jaws of the clamp. Some machines have a ***hopper***, a dispenser which drops one button at a time into the clamp. The work must be placed in the exact spot where the button is to be sewn. The button must be lined up with the holes exactly under the needle to prevent breaking the needle. Then, the machine automatically sews on the button and cuts the thread at the end of the sewing cycle.

Decorative Stitch Machine

A ***decorative stitch machine*** adds design to a garment in the form of a monogram, embroidery, edge scalloping, or rows of fancy stitching. Decorative stitches are made by using cams to form the sewing design. Although the stitch is made automatically, the operator must feed and guide the work. Different thread colors can be used on two-needle machines to create a decorative effect. Attachments are often used with these machines. For example, a trimming attachment may be used when scalloping edges of fabric to trim away excess fabric below the scalloped edge.

Use of Industrial Sewing Machines

Many of the sewing machine parts and functions discussed in the previous section on conventional sewing machines are similar to those found on industrial sewing machines. Thus, a thorough understanding of the conventional sewing machine helps one understand how an industrial sewing machine functions. Because of the similarities between conventional and industrial sewing machines, this section primarily addresses information that is unique to the industrial sewing machine.

Figure 19.5 may be used to review the parts of industrial sewing machines. Parts found on most industrial sewing machines include the switch, needles, thread take-ups, tension assemblies, thread guides, feeds, throat plates, and machine beds. Lock stitch machines have bobbins, shuttles, and hooks to carry the bobbin thread. Chain stitch machines have loopers which may or may not be threaded with a bottom thread. Sometimes parts or attachments have more than one name.

As with conventional sewing machines, the head is the main part of the machine. The bed is the flat base of the machine that contains the bobbin and bobbin case. The following parts of an industrial sewing machine perform specific tasks:

- table – The ***table*** supports the sewing machine.
- stand – The ***stand*** consists of legs that support the table.
- motor – The ***motor*** is the power unit that drives the machine. The motor continuously turns and has a built-in clutch and a built-in brake.
- treadle – The ***treadle*** is a platform on which the operator's feet are placed. The treadle controls the motion of the machine.
- knee press – A ***knee press*** is used to raise and lower the presser foot as the knee is pressed against it and released. The knee press is mounted under the table.
- balance wheel or machine driving pulley – The wheel on the right side of the machine's head is called the ***balance wheel*** or a ***machine driving pulley***. The wheel may be used by hand to position the needle up or down while the

machine is stopped. The wheel receives the driving force from the belt while the machine is in operation.

- belt – A ***belt*** rotates around the balance wheel and drives the wheel. The belt is attached to the drive of the motor which is located under the sewing machine table. The belt transmits power from the motor to the machine driving pulley.
- thread stand – The ***thread stand*** is positioned above the machine head to the right side of the machine. It holds one or more cones of thread.
- sewing lamp – A ***sewing lamp*** is a light that is usually attached to the back left side of the sewing machine head. It directs light on the needle area so that work can easily be seen. The sewing lamp can be adjusted and positioned as needed.

The needle used on industrial sewing machines can be straight or curved. For example, blind hem needles are curved. Basically, the same guidelines discussed in the section on conventional sewing machines apply to using a needle for an industrial sewing machine.

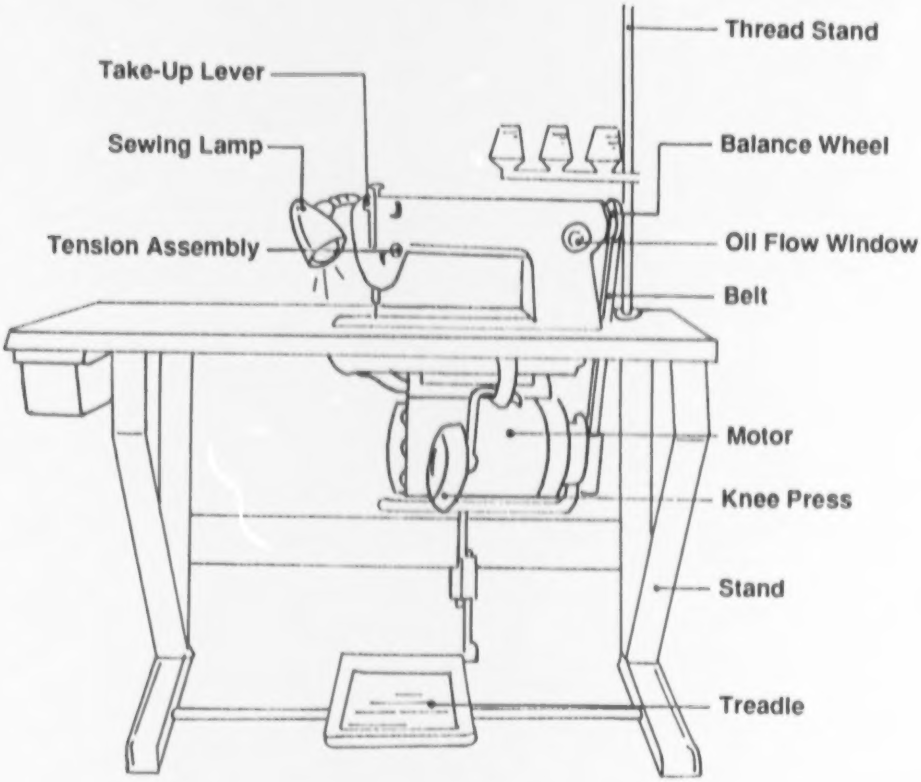


Figure 19.5

Procedures for Stitching – After the looper (on chain stitch machines) or shuttle hook in the bobbin case (in lock stitch machines) catches the needle thread loop to form the stitch, the thread take-up lever pulls the loop of thread free and tightens the stitch. The tension assembly controls the flow of thread as the stitches are formed. The tension assembly usually consists of two pressure discs, a tension spring, a thumb-nut pressure control, a tension mounting bar, and the pressure release unit. Some sewing machines have a check spring to help measure the thread flow. The thread must be guided between the pressure discs so that the thread presses against the tension bar constantly as the machine sews.

Thread guides help control the thread as it travels from the thread spool or cone to the needle. There are thread guides at various places on the machine head between the spool, the tension assembly parts, the take-ups, and the needle to ensure that the thread flows evenly. Guides can be found in the following forms: eye, hook, spring, snap, slot, pigtail, tube, and groove.

As with conventional sewing machines, the presser foot holds the fabric as the needle makes each upward motion. The presser foot also provides a smooth surface for the fabric to slide against as the feed makes its forward motion. The presser foot and the feed work together. The pressure applied to the presser foot must be adjusted depending on the weight of the fabric. The pressure regulator is found in different locations on different industrial machines. The presser foot is lowered for sewing and raised for positioning or removing work. It may be raised or lowered with a lever on the back of the machine head or with a knee press.

The operator can choose different shapes and sizes of presser feet depending upon the sewing task. The presser foot can be used with other attachments such as folders, guides, or devices for shirring, cording, or welting. The presser foot can also serve as a margin guide or as a support for thread cutters or any other device used behind the needle.

The feed moves the fabric forward between stitches. It makes one forward motion for each stitch. Stitch length is usually stated in stitches per inch (S.P.I.). The stitch length may be adjusted, usually from eight to twenty-two, with the stitch regulator. The teeth of the feed must be sharp enough to catch the fabric without cutting or damaging it. The teeth are slanted so that they do not drag the fabric on the backward stroke. If the teeth on the feed are dull, the feed mechanism will not move the fabric forward properly.

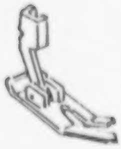
The throat plate provides a surface over which the material passes as it is stitched. The feed fits in the throat plate to help move the fabric under the needle. The throat plate has a hole for the needle to pass through. This hole must be the correct size and shape for the needle and the stitch used. The hole can be round, pear-shaped, or slotted. Adaptations can be made in the throat plate and the feed when attachments are used.

As with conventional sewing machines, the bobbin and its case (in a lock stitch machine) fit into a shuttle. The most common types of shuttles are the oscillating shuttle and the rotary shuttle.

Procedures for Winding Bobbins – Most lock stitch machines have a bobbin winder mounted on the right side of the machine near the belt. The bobbin winder is used to wind thread around a bobbin. The bobbin thread is used as the bottom thread in the sewing operation. When the lever on the bobbin winder is pushed forward, the pully touches the machine belt with enough pressure to wind the bobbin. The bobbin winder can be adjusted if the pressure against the belt is not correct. Once the bobbin winder is in the correct position, however, it is rarely necessary to readjust it.

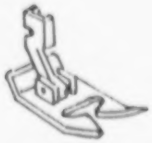
Thread from a cone on the spool stand is threaded down into the bobbin and wound around it a few times before the bobbin winder is engaged. If the thread does not spread evenly over the bobbin, the tension bracket can be adjusted until the thread does spread evenly. The bobbin should not be wound so full that it does not fit in the bobbin case easily. A spring on the bobbin winder can be adjusted until the bobbin winds with the correct amount of thread. Unless prewound bobbins are used, new bobbins should be wound ahead of time so that bobbins are ready when they are needed.

Functions of Loopers – Instead of a bobbin, the chain stitch machine has a looper which is sometimes threaded. The looper performs the same function as the shuttle hook. Its point must meet the needle at the right time to catch the loop of the top thread. The main difference between the bobbin and the looper is that new bobbins must be constantly wound and replaced on the lock stitch machine, while the bottom thread from the looper comes from a large cone on the thread stand. On some machines a ***loop spreader*** helps the looper function by making the needle-thread loop bigger.



Straight Stitch Foot

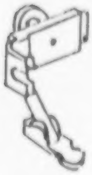
Machine Beds – Machine beds can be horizontal or vertical. Types of horizontal machine beds include flat, cylinder, raised, feed-off-the-arm, and post. The two vertical types of beds are closed and open. Several different beds are used in sewing operations because one operation may be easier to perform using one bed type than another. Table 19.1 illustrates types of horizontal machine beds.



Zigzag Foot

SEWING MACHINE ATTACHMENTS

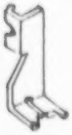
An ***attachment*** is a device used with a sewing machine to increase efficiency or produce special effects. Attachments can increase speed and efficiency and may often perform three or four sewing jobs in one operation. Various types of attachments are available for conventional and industrial sewing machines. Attachments are made to roll, fold, insert, or guide the plies of fabric so that they arrive in the desired position at the needle. Attachments can be removable or built into the machine. They may or may not be interchangeable on different sewing machines. Machines with built-in attachments are sometimes called converted machines. The throat plate, presser foot, and feed may have to be altered to fit some attachments.



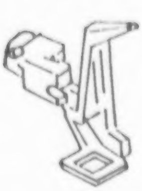
Zipper Foot

Presser Feet

Many different types of presser feet are available for use with sewing machines. Each foot performs a specific task. The ***straight stitch foot*** is the ordinary presser foot that is used for single-needle, straight stitching. It is a narrow foot with one side shorter than the other side. The ***zigzag foot*** is used for zigzag stitching or straight stitching. It is wider than the straight stitch foot and both sides are the same length. The ***zipper foot*** is used to stitch any seam that has more bulk on one side than on the other. This foot is also used to insert zippers, sew bound buttonholes, and cover cording. The ***invisible zipper foot*** is used to insert a special type of zipper called an invisible zipper. The bottom of the foot has two channels through which the zipper coils pass while the zipper is being stitched.



Button Foot



Embroidery Foot

The ***button foot*** is used to sew on buttons by machine. The button foot holds a button in place while stitching is done. The ***buttonhole foot*** is used to stitch buttonholes and may be made of metal or plastic. The ***embroidery foot*** is used to stitch decorative patterns on fabric. There are grooves in the bottom of the foot that allow dense embroidery stitching to pass easily under the foot. A ***cording foot*** has a built-in device that allows cord to be fed and attached to the fabric being stitched. An ***overedge foot*** is used to place stitches over the edge of fabric. A metal bar holds the fabric edge in place so the stitches will be placed properly by the overedge foot.

Width Gauges and Edge Guides

Width gauges are probably the simplest of all attachments. The ***width gauge*** or ***edge guide*** is an attachment that helps in stitching a specified distance from the edge of the fabric. Most fabric is not stiff enough to hold its shape when pressed against the side of a width gauge. The fabric must be fed correctly through the width gauge to produce seams of correct widths or stitching that is specified distances from the edges.

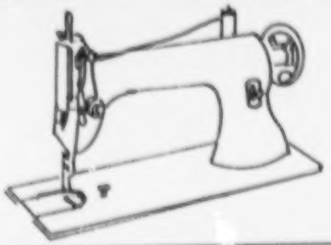
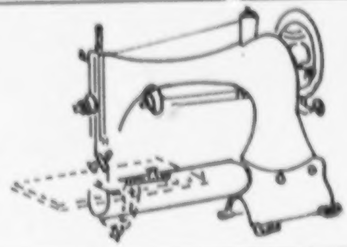
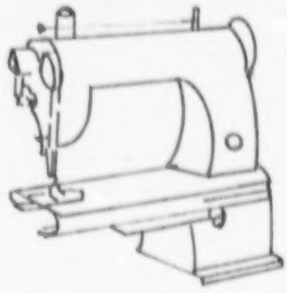
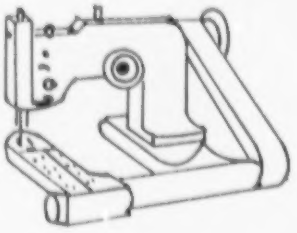
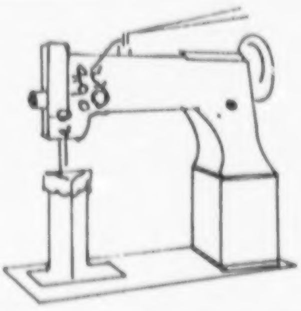
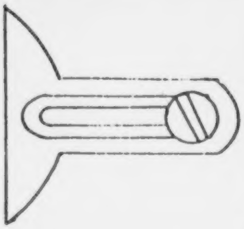
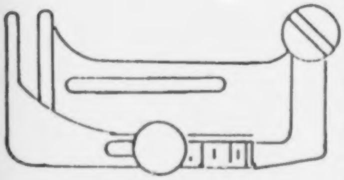
Flat Bed The flat bed is the most common type of machine bed. It is used when work is laid flat for sewing.	
Cylinder Bed The cylinder bed is tube shaped and is used for sewing concave or tubular items. This bed would be useful for sewing around items such as pants cuffs.	
Raised Bed The raised bed is similar to the cylinder bed but it is used for larger tubular items. For example, a dress hem might be sewn on a raised bed.	
Feed-Off-the-Arm Bed The feed-off-the-arm bed has a free narrow arm that allows stitching to be done free of a work surface. Its main function is performing tasks such as closing sleeves and legs. The support for the machine with this type of bed is usually a pedestal.	
Post Bed The post bed is used for sewing places that are hard to reach such as the inside of a handbag. The article, such as the handbag, is placed over a post under the needle bar with its sides suspended around the post.	

Table 19.1



Single-Setting Gauge

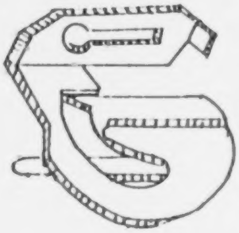
Two main types of width gauges are used. One type, the ***bed-type width gauge***, is attached to the bed of the machine with a thumb screw or slotted screw. The other type, the ***foot-type width gauge***, is made as a part of the presser foot. The bed-type gauge allows greater flexibility. The foot-type gauges are used mainly for narrow seams. Many varieties of bed-type width gauges are made. The single-setting, double-margin setting, and multi-margin setting width gauges are used most often. All of these are attached to the bed of the machine with screws that fit into open slots. A ***single-setting gauge*** allows an operator to sew only one width setting by using the gauge as a guide.



Double-Margin Gauge

The ***double-margin gauge*** has two walls and allows more flexible measurements. The front wall (on the left) is attached to an arm that can be swung away by the operator without unscrewing the gauge. A different setting remains on the fixed arm or second wall. The front arm of this gauge has an adjusting screw so that the operator can set the two walls apart at any distance. For example, the first wall may be set for a 3/8" width and the second or inner wall may be set for a 3/4" width. The gauge is used when the width of a seam is changed or when only the front arm of the gauge is needed. The operator can swing the gauge out of the way to sew without any gauge at all. For this reason, it is sometimes called a swing gauge. The ***multi-margin gauge*** also is called the ***butterfly gauge***. It has three types of edges. It is used when the work being sewn has both straight and curved edges.

Hemmers



Hemmer

Another frequently used attachment is the hemmer. The ***hemmer*** is an attachment that will roll or fold the edge of fabric to form a hem. Some hemmers are part of a special presser foot while others are attached to the machine bed with screws. A ***folding hemmer*** makes a wide fold and is usually attached to the machine bed rather than to the presser foot. A ***rolled-edge hemmer*** rolls and holds a narrow hem while the hem is being stitched. Hemmers are often used with other attachments to perform tasks such as inserting stiffening, elastic, or trim.

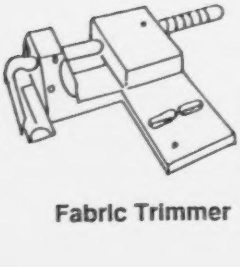
Folder

A folding attachment or ***folder*** performs about the same job as the hemmer does but on more than one ply of fabric. This attachment folds fabric into the desired seam shape before it is fed under the needle. There are many varieties of folders for different tasks. For example, a folder can be used to add a binding to an edge. A folder can be used in combination with other attachments such as those that add tape, lace, rickrack, or other decorative trims.

Lapped Seam Attachments

Lapped seam attachments can be used on one-needle, two-needle, or multi-needle machines. The double-lapped seam is a widely used type of seam closing. It is frequently used on men's shirts, women's blouses, and trousers. The fabric is slid into the attachment from the sides. Accurate feeding is essential. The operator must hold each ply at the proper tension to ensure that the plies will finish evenly.

Cutting and Trimming Attachments

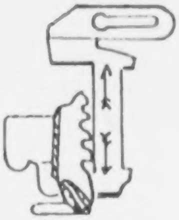


Fabric Trimmer

Thread cutters can be automatic or manual. A knife cuts the thread after the seam is finished while the needle is at its highest position. The ***fabric trimmer*** attachment is used to cut away extra fabric while a seam is sewn. The trimming may be performed by a knife built into the machine or by an attachment. Attachments are adjustable for different seam widths. Trimming-off attachments are often used in sewing French seams and with sergers. A ***knife attachment*** can be used to cut between two rows of stitching as when making slit pockets or buttonholes. Another type of knife attachment cuts sewn fabric into specific lengths such as those needed for belt loops. Cutting attachments are even available to pink seams as they are sewn. The ***chopper-type pinker*** cuts one triangle from the fabric with each downward motion of the needle bar. When using the ***rotary pinker***, the fabric is pressed between two wheels and pinked as the seam is sewn.

Attachments for Adding Trim

Various attachments are available for adding trim. Rolls of trim are usually fed automatically from one spool into an opening in the attachment. The spool of trim may be placed on top of the table, under the table, or beside the sewer. Trim can be fed on the top or bottom of the seam or even between plies. The trim can be fed through the presser foot, through a bed attachment, or through a combination attachment. The sewer starts the operation and keeps the trim from becoming twisted. A ***binder*** is an attachment that positions fabric and binding (trim that binds the edges of fabric plies) so they can be fed under the needle together and stitched.



Binder

Cording and Welting Attachment

A ***Cording and welting attachment*** automatically feeds rolls of cord or tape between two plies of fabric and sews the cord or tape into a seam while the seam is being stitched. A cording and welting attachment can be used with other attachments to create a variety of decorative effects.

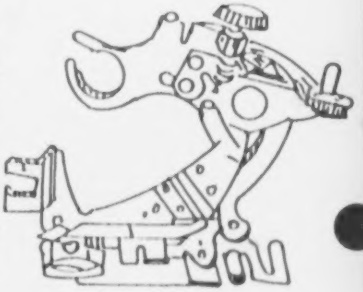
Pleating Attachments

A ***pleating attachment*** folds a series of pleats. The pleats can be folded either one after the other or at regularly spaced distances. The number of pleats of a specific size that can be made from a specific length of fabric can be predetermined. The fold is controlled by the pleating attachment and the spacing is controlled by the stitch length regulator. The fabric must be fed into the pleater at an even rate.

Gathering and Shirring Attachments

Gathering and shirring attachments gather fabric. ***Gathering*** is the process of drawing a specific amount of fabric into a smaller area by using one or several lines of stitching. Gathers are soft, even folds of fabric. Gathering is used for decorative purposes and during garment construction for tasks such as setting in sleeves or gathering fabric onto a yoke. ***Shirring*** is primarily a decorative method used to control fullness in a garment. Shirring is formed with multiple rows of gathering.

One gathering attachment is a gathering foot, a special type of presser foot. The ***gathering foot*** gathers up a length of fabric as it is being stitched. Some gathering feet will gather one ply of fabric while stitching it to a second ply of fabric that is flat. A ***ruffler attachment*** is a larger attachment that quickly gathers a length of fabric.



Ruffler

Gathering attachments are sometimes used to form ruffles. A ***ruffle*** is a strip of fabric cut and manipulated to produce fullness. A ruffle is gathered on one side while the other side is left without gathers. Ruffles can be applied to the top, middle, or bottom ply of work by using attachments. Ruffling also can be performed on a single ply which is then attached to another ply. Rows of ruffles can be applied to the same piece of fabric. Ruffles can be continuous or spaced at regular intervals.

CARE OF SEWING MACHINES

It is important to keep sewing machines in good condition by cleaning, oiling, and servicing them regularly. The manufacturer's instructions for each machine include information on how to clean and oil the machine. The regularity of cleaning a sewing machine depends on how much it is used. A sewing machine that is used daily in apparel manufacturing or custom sewing should usually be cleaned daily. Lint from fabric collects around the bobbin area and the needle bar. If left uncleaned, this lint can eventually clog the machine and harm it. The following general guidelines should be followed when cleaning a sewing machine:

- Disconnect the machine from the electrical outlet.
- Wipe the base of the machine with a soft cloth to remove lint and fuzz.
- Move the needle bar to its lowest position and wipe it with a soft cloth to remove lint and fuzz.
- Open the slide plate and remove the throat plate in order to clean the bobbin case area.
- Tilt the sewing machine head back if necessary in order to reach the bobbin case and other areas under the base of the machine.
- Clean the bobbin and the bobbin case by brushing them gently with a soft brush.
- Remove any large accumulations of lint from around the feed and bobbin case area.
- Remove old oil by wiping sewing machine parts with a soft, clean cloth.

Every sewing machine must be oiled on a regular basis. The manufacturer's instructions include specific guidelines regarding where to oil each sewing machine. High grade sewing machine oil should be used. For conventional sewing machines, usually only one drop of oil is placed in each appropriate location. After oiling the machine, it is best to wipe the machine with a clean cloth to remove any excess oil. After oiling the machine, it should be plugged into an electrical outlet and tested. Stitching should be done on a sample of fabric to ensure that all excess oil is removed. This step is important because excess oil can stain fabrics being sewn.

Industrial sewing machines require much attention in terms of oiling. Without the right amount of oil applied properly, various moving parts will not operate correctly. As a result, heat builds up and sewing machine parts may be damaged. Most modern industrial machines have fully automatic lubrication systems. A lubrication system allows oil to be circulated continuously to all parts of the machine that require lubrication. The operator must monitor the oil supply to ensure that enough oil is available for the lubrication process.

Most industrial machines have an oil reservoir under the bed of the machine. The side of the reservoir has "high" and "low" marks. The level of oil in the reservoir must be kept between these two marks. The sewer should tilt the machine head back each day to clean it. At this time, it is important to check the oil reservoir level. If the oil level is much below the "high" mark, oil should be added. It is important to use only a high grade sewing machine oil supplied by the employer. On most industrial machines, there is an oil flow window located on the front of the sewing machine head. When the lubrication system is working properly, a steady stream of oil can be seen flowing behind the oil flow window. If the stream of oil stops or becomes uneven, the machine should be stopped immediately, and a mechanic should check the machine.

While the industrial sewing machine head is tilted back, it is important to clean the oil pump that is located inside the base of the machine. An oil pump screen covers the oil pump. The screen should be cleaned with a soft cloth to remove any build-up of lint or dirt. Any other accumulations of lint, fabric, oil, or dirt found under the base of the machine should be cleaned. Figure 19.6 provides illustrations of the areas under the base of an industrial sewing machine, the oil reservoir, and the oil flow window.

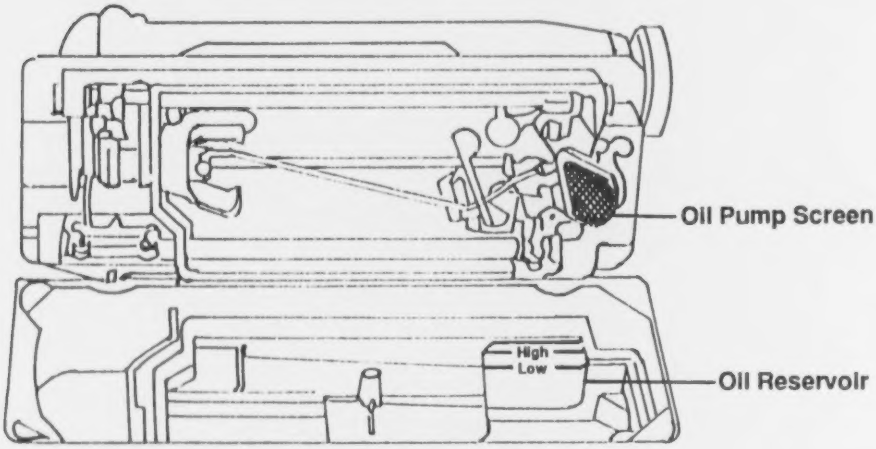


Figure 19.6

Sewing machine operators can learn to make some adjustments and simple repairs to their sewing machines. This reduces the loss of production time while the operator must wait for a mechanic. Apparel manufacturing plants have mechanics on duty to make complicated adjustments and repairs. Operators should never attempt to make repairs or adjustments that they are not trained to perform.

The following warning signals can alert an operator when repairs are needed:

- unusual noises in the machine or motor
- excessive oil accumulation on the outside of the machine
- smoke
- excessive lint, threads, and fabric in and around the sewing and drive-belt area
- machine running faster or slower than normal
- unusual vibrations
- any part of the machine becoming unusually hot
- odors caused by burning electrical insulation, hot oil, overheated metal, or burning thread

Table 19.2 includes information on possible causes of and solutions for various sewing problems.

MISCELLANEOUS SEWING EQUIPMENT AND TOOLS

Besides sewing machines, a variety of equipment and tools are necessary in order to produce apparel and textile products. In apparel and textiles manufacturing plants, large industrial equipment is used for various steps in the manufacturing process. In custom sewing, dressmaking, and tailoring, tools and equipment much like those used in home sewing are utilized. This section of Chapter Nineteen includes information on basic equipment and tools used in the cutting, marking, and sewing processes. Detailed information on tools used for measuring is included in Chapter Ten.

Cutting Equipment and Tools

Equipment – There are various methods used to cut fabric. ***Cutting*** is the actual severing of fabric into various garment parts. In apparel manufacturing plants, cutting is a process that includes spreading fabric on large cutting tables,

Sewing Problem	Possible Causes and Solutions
Broken needle thread	Sharp or rough surfaces over which the thread passes (such as thread guides, tension assembly, take-up lever, needle, throat plate, bobbin, bobbin case, looper, presser foot, and feed); improper threading; poor quality thread; adjustment of top thread tension too tight; needle incorrectly positioned in needle bar; damaged needle; wrong size needle; stitching without having take-up lever at highest position; interference with turning of thread spool or cone; dirt or lint packed under throat plate; machine out of adjustment.
Skipped stitches	Interference with the top thread loop formation caused by lack of control of fabric; wrong needle size; needle hole in the throat plate too large; incorrect type of presser foot, feed, or throat plate; needle incorrectly positioned in needle bar; poor quality thread; fabric interfering with thread loop formation by clinging to needle; damaged, dirty, or oily needle; lint packed in bobbin case area where thread loop is formed; incorrect setting and timing of machine.
Breaking of bottom thread	Burrs (roughness) on the underside of the throat plate and edges of feed; bottom tension too tight; sharp edges on bobbin case tension spring or on surfaces over which the bobbin passes; too much friction of bobbin against the spindle on which it is supported; improperly wound bobbin; improperly threaded bobbin case; burrs on looper; incorrect timing of the machine.
Looping or loose stitching	Incorrect tension setting; wrong thread or needle size for fabric; rough surfaces over which the thread passes; friction on the top thread due to fabric that slows the pulling up of the loop; interference with free passage of the top thread around the bobbin case; dirt or lint packed in the shuttle hook area; loose bobbin case, loose bobbin case latch, or improperly threaded bobbin; wrong needle plate used.
Poor feeding of fabric	Improper setting of the presser foot or feed; incorrect feed timing.
Irregular length of stitches or puckering of fabric	Presser foot not holding fabric securely; feed dragging fabric on its backward stroke due to incorrect timing; wrong style or wrong size needle; blunt point on needle; tension too tight; needle hole in throat plate too large; excess pulling and stretching of fabric while stitching; feeding too much fabric while stitching.
Cutting of fabric on the underside	Feed too high; too much pressure on presser foot; rough spots on throat plate or attachments; feed teeth too sharp, worn, or chipped.
Soiling of fabric	Improper cleaning of machine; use of wrong lubricant; oil flow too great.
Machine is noisy	Machine needs oiling; blunt needle; threads hung in shuttle hook area; dirt, lint, or oil between throat plate and feed; loose parts or loose belt; feed set too high; loose bobbin case.
Bending or breaking of needles	Pulling of fabric while sewing causing needle to strike throat plate; portions of fabric too thick or heavy for needle size; blunt point on needle; loose needle clamp screw; hole in throat plate too small; loose throat plate; loose presser foot; top thread too heavy for needle; stitching over basting pins; timing of thread take-up lever needs adjustments; timing of feed and needle need adjustments.

Table 19.2

severing the fabric into garment parts, and notching or marking pieces using another method. Before cutting can be done in a manufacturing plant, fabric must be spread on tables.

Spreading is the laying down of many layers of fabric, each on top of the preceding one, into a stack. Several methods and machines may be used for spreading. Spreading allows for many plies of fabric to be cut at the same time to increase efficiency. The oldest method of spreading involves suspending a roll of fabric on a pipe over one end of a cutting table. Two employees, called spreaders, grasp opposite ends of the pipe and walk to the opposite end of the table pulling fabric off the roll onto the table as they walk. The spreaders continue to walk back and forth from one end of the table to the other spreading multiple layers of fabric on top of each other. The stack of fabric is referred to as the ***spread*** or the ***lay***. In some situations, the lay may be stacked to a height of 6".

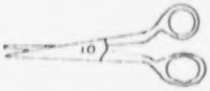
The most modern and accurate method of spreading is done by using a spreading machine. The ***spreading machine*** consists of a device on which a roll of fabric is suspended on a revolving rod above a carriage on wheels. The carriage moves up and down the length of the table as it unrolls fabric. Various attachments may be added to spreading machines. For example, some spreading machines are adjustable so they may be used on tables of different widths. Most spreading machines have an electronic eye attachment that automatically aligns one edge of each lay with each preceding edge. Some spreading machines have cloth inspection devices attached. These devices provide extra lighting so that the employee guiding the spreading operation can note defects in the fabric before it is spread. Some spreading machines have a small step attached to the side of the machine on which an employee can stand. The step moves along beside the table as the spreading machine is propelled along.

No one single cutting method is best for all manufacturing purposes. In manufacturing, cutting methods include the following: vertical knife, band knife, circular knife, die cutting, computer driven knife, water jet, laser, plasma cutters, and automated cutting techniques. Different segments of the manufacturing industries choose different cutting techniques depending on the products they manufacture and the costs involved. Vertical knife cutting is the most common cutting method used in apparel manufacturing. This method involves an electrically driven blade that moves up and down rapidly. The blade is suspended from a head that is mounted on a vertical arm. The entire arm is mounted on a chrome base so it can be moved easily on a table surface. An employee called a ***cutter*** manually guides the device to cut the lay.

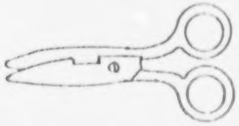
Automated cutting techniques have been developed by several companies. ***Automated cutting systems*** involve the use of a very slender needle knife that is suspended from a bar above the cutting surface. The tiny knife does not disturb the lay very much so that very accurate cutting is done. The knife electronically senses when it is not at a right angle to the fabric edges and corrects itself automatically. It also sharpens itself automatically during the cutting process at predetermined intervals. The knife cuts at the rate of 300" to 1200" per minute. A computerized system is used to determine how garment pieces are cut.

An automated cutting system is often mounted on tracks that are attached to the floor. The cutting device is moved on the tracks to the end of a cutting surface. The lay of fabric that has already been spread is moved by a special conveyor that allows the fabric to be moved without stretching or disturbing it. The top ply of the lay is covered with a plastic film once it is on the cutting surface. The special cutting surface is designed to allow a vacuum to be applied to the lay of fabric. Tufts of bristles form the cutting surface and holes are spaced between the tufts. These holes allow a vacuum to extract air from the fabric by a suction process. The vacuum process reduces the height of the lay by more than 50 percent and holds the plies of fabric firmly together to prevent movement

Sewing Scissors



Embroidery Scissors

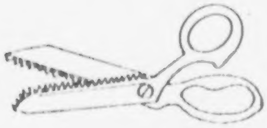


Buttonhole Scissors

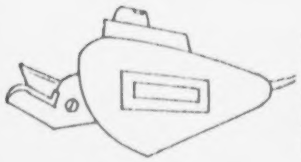
Seam Ripper

Thread Clippers

Bent-Handled Shears



Pinking Shears



Electric Shears

during cutting. A lay of fabric cannot exceed 3 1/2" in height if it is to be cut by an automated cutting system.

Other methods of cutting in apparel manufacturing settings are not as frequently used as those previously described. ***Laser cutting*** involves the use of a laser cutter that is attached to a bar above the cutting area and extends the width of the cutting area. Carbon dioxide gas is used to sever the fabric and leaves a fused edge on fabrics made of certain types of manufactured fibers. The fusing process seals the edges of fabric and eliminates the need for seam finishing to control fraying. ***Water jet cutting*** involves the use of a fine stream of water propelled under great pressure to cut fabric.

Tools – Accuracy is essential when cutting out garments. Even edges, obvious notches, and true curves make sewing simpler and more accurate. If a garment's pieces are cut even 1/8" or 1/4" larger or smaller than the pattern piece, the garment will be a different size than intended. A variety of cutting tools are available as sewing aids.

Shears, pinking shears, and scissors are used for sewing done by custom sewers, dressmakers, tailors, and alterationists. ***Sewing scissors*** are used for snipping threads, trimming, and clipping. These scissors are pointed, have two handles that are the same size, and have blades 5" to 6" long. ***Trimming scissors*** or ***thread scissors*** are usually about 4" to 6" long. They are used for small cutting tasks such as clipping threads. ***Embroidery scissors*** are 3" to 4" long and are used for tasks such as cutting corners of bound buttonholes and embroidery work. ***Buttonhole scissors*** are small scissors that are primarily used to cut open buttonholes.

Seam rippers are used for removing stitching from fabric and are 3 1/2" to 4" long. A seam ripper has a pointed end for picking up stitches and a razor-like edge for cutting the stitches. ***Thread clippers*** fit in the palm of the hand and are squeezed to press the pointed blades at the end of the clippers together in order to cut threads. A spring mechanism makes them spring apart between clips.

Shears are used to cut fabrics and have two cutting blades that make the shears at least 6" long. The two handles are shaped differently to fit the hand comfortably. ***Straight-handled shears*** are used for general sewing tasks. They range from 6" to 12" in length. The most popular size is 7" to 8" long. ***Bent-handled shears*** are 7" to 9" long. The bent handle makes cutting more accurate because it allows the fabric to rest closer to the cutting surface as it is cut.

Pinking shears are used to finish seams by trimming while automatically making a zigzag cut or scalloped cut. ***Electric shears*** are available in both electric and battery-powered models. They can cut quickly and accurately with less stress on the hand and are especially useful for reducing the physical effort of cutting heavy fabrics or large quantities of fabric. Shears should be selected based on the cutting task to be done.

Cutting surfaces should be at least 30" wide and 48" long. A more ideal area would be 38" high, 36" or more wide, and 6' to 8' long. The surface should be accessible from all four sides to make pattern layout and cutting easier. In an apparel manufacturing plant, cutting surfaces may be quite long and large. A ***cutting board*** is a portable cutting surface made of heavy cardboard and is marked with a grid. A cutting board protects the table top from damage, and it folds for storage.

Marking Equipment and Tools

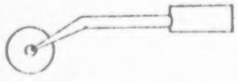
Equipment – An activity closely related to the cutting process in apparel manufacturing is the marking of multiple garment pieces. Since speed is very important in mass production of apparel, marking techniques may be used that are quite different from those used by employees who sew for individual clients. ***Position marking*** is a marking technique that involves cutting tiny slashes at appropriate locations in garment pieces. These slashes serve as guides for sewing machine operators to help them in matching seams, placing pockets, and locating folds or stitches for tucks, pleats, and darts.

Drill holes, small holes created in fabric by automated cutting systems, are sometimes used to position darts, pockets, and plackets. Drill holes can only be used in certain types of fabrics and must be placed carefully because they leave permanent holes in fabric. Another marking technique involves the injection of a marking fluid through a hollow needle. This method eliminates the placement of permanent holes in fabric. Different types of fluids are used. The markings made by some fluids can only be seen under black light; other fluids produce markings that can be seen under conventional lighting. Other marking techniques used in apparel manufacturing involve the use of chalk, powder, and other manual marking devices. These techniques involve marking each lay of fabric individually and are slower than the techniques described previously.

Marking for shade is a technique used in apparel manufacturing that helps gather bundles of garment pieces from the same shade group. Since large volumes of fabric are used in apparel manufacturing, the shading of different rolls of the same type of fabric may differ slightly. Good quality garments are made from fabric that comes from the same shade group so that the fabric of all pieces in one garment match. A machine called a Soabar™ may be used to mark every cut piece. This machine automatically attaches a ticket (a tiny gummed paper stamp) to each garment piece. Each stack of identical garment pieces cut from a single lay of fabric is clamped together. Each ply is individually stamped by the Soabar™ machine with consecutive numbers. The process can begin by numbering the bottom ply or the top ply of each stack, but all stacks must be numbered consistently for the process to work correctly. During the sewing process, all garment pieces with identically matched numbers are brought together to form a single garment of perfectly matched fabric.

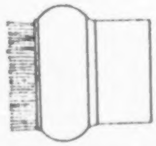
Tools – Marking tools are essential for custom sewers, tailors, dressmakers, and alterationists. Marking is done to transfer pattern symbols found on pattern pieces to the fabric. Pattern symbols identify specific construction details. Information on pattern symbols is included in Chapter Twelve. Marking tools and techniques are selected based on the type and weight of fabric being marked.

A ***tracing wheel*** is a marking tool that consists of a wheel attached to a handle. The wheel may be a sawtooth tracing wheel for marking sheer or delicate fabric (without carbon paper), a blunt-tooth tracing wheel for marking most fabrics (with carbon paper), or a smooth-edged tracing wheel that is usually used on knit fabrics (with carbon paper). Slight pressure is applied as the tracing wheel is rolled along a pattern symbol. ***Dressmaker's carbon paper*** is used with some tracing wheels to transfer pattern symbols to the wrong side of fabric. Carbon paper is available in different colors and has one side that is coated with a waxy substance. The paper is placed between fabric plies, and color on the waxy side is transferred to the fabric as the tracing wheel is rolled across it.



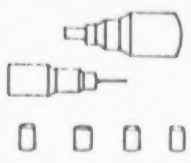
Tracing Wheel

Tailor's chalk is a clay based, chalk material that is used to mark fabrics. Tailor's chalk is available in white, black, and colors. The most convenient chalk forms are squares that come in a refillable plastic holder (tapered to a fine edge on two sides) and hand-held rolling dispensers filled with chalk powder. Tailor's chalk is used to mark silk, cotton, linen, wool fabrics, and fabrics made from manufactured fibers. Since chalk will rub off easily, it is used primarily when altering or constructing garments that will be completed quickly.



Tailor's Chalk

Tailor's wax is a marking material made from white or colored wax in the form of a square. Like tailor's chalk, it is tapered on two sides so that the fine



Tailor's Tack Marker

edges may be used for marking. This material is primarily used by tailors and alterationists when constructing or altering wool garments since it leaves a stain on many other fabrics. The wax can be removed from wool fabrics by pressing since heat causes the wax to disappear. A ***tailor's tack marker*** is a small device used to mark with chalk simultaneously on the opposite faces of two plies of fabric. The device consists of two parts that each contain chalk. Each part is positioned on opposite faces of two plies, and chalk marks are made on the fabric. It may be used instead of thread markings or when a tracing wheel would damage the fabric.

Dressmaker's Marking Pencil

A ***dressmaker's marking pencil*** is a form of tailor's chalk used for most hard-surfaced fabrics. It consists of chalk constructed in the form of a pencil and usually has a brush at one end to brush chalk markings away. Various types of dressmaker's marking pens are available. ***Dressmaker's marking pens*** use special types of ink. For example, some pens contain ink that disappears from fabric within twenty-four hours. Other pens contain ink that is visible on the surface of fabric until the fabric is moistened. The ink marks disappear when moisture is applied. These pens are usually used with washable fabrics since moisture may spot or stain fabrics that must be dry cleaned.

Thread markings are made using a hand needle and sewing thread. Two types of thread markings are tailor's tacks and hand basting. ***Tailor's tacks*** are used to mark fabrics when carbon paper and marking pencils or pens cannot be used. Procedures for making tailor's tacks are included in Chapter Twelve. Basting is a temporary stitching technique used for various purposes including marking fabrics. Glazed mercerized cotton is used to make thread markings on most fabrics; silk thread is used for fine fabrics and when stitches are not to be removed before pressing. It is best to use white or light-colored thread since dark colored threads may leave a permanent smudge on fabric if pressed.

In addition to their other uses, straight pins are sometimes used to temporarily mark fabrics. Pinning is not as accurate as other marking methods. ***Straight pins***, discussed in table 7.3 of Chapter Seven, are available in brass, steel, or stainless steel. They may have ballpoints, large heads (made of glass or plastic), T-shaped heads, or flat heads. Glass or plastic ball head pins are easier to see and handle than flat-head pins. T-head pins are particularly useful when sewing pile fabrics and loose knits. Rust-proof stainless steel or brass pins are used with most fabrics. Pins are available in various sizes which are identified by numbers. The longer the pin, the thicker it is in size. Long, thick pins are used for heavy fabrics; shorter, thinner pins are used for medium-weight fabrics. Short, fine pins are used for lightweight, special, or delicate fabrics. Ballpoint pins are recommended for knit fabrics because the ballpoint tip separates and passes between yarns rather than penetrating and cutting yarns.

Pin Cushion

Emery Bag

Pin cushions are firmly stuffed pillows available in a variety of shapes and sizes. Some pin cushions are attached to a clip that may be held on the wrist for convenience. Some pin cushions have an emery bag attached. The ***emery bag*** is a small cushion stuffed with a special granulated material that cleans and sharpens pins and hand sewing needles. Magnets are sometimes used to locate pins that are dropped while sewing. Magnetic pin cushions hold pins by magnetic force.

Sewing Tools and Supplies

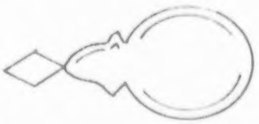
Small hand tools and supplies are important to the appearance of the finished garment. Quality workmanship is not possible without having the proper tools and supplies available. Important tools in the sewing process are items such as needles, thread, and thimbles. Each of these tools contributes to the appearance of the finished product. For example, a needle that is too coarse will leave holes in the fabric. A blunt needle can snag or pull fabric threads. The wrong thread can cause seams to pucker or break when the garment is worn.

General hand needles are used for general-purpose sewing. The types of general hand needles include sharp, between, milliner, ballpoint, and calyx-eye needles. Each type of general hand needle is described in table 7.3 of Chapter Seven. Other types of needles are used for needlecraft, darning, and heavy-duty sewing. These various types of needles are also described in table 7.3.

Sewing machine needles are selected according to the weight and type of fabric sewn. Various types of machine needles are described in table 7.3. In addition, types of points available on different sewing machine needles are described in the section in Chapter Nineteen titled "Using Sewing Machine Needles."

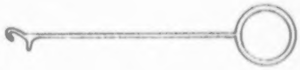
Special hand tools and supplies include needle threaders, tissue paper, transparent tape, tweezers, loop turners, pliers, emery boards, bodkins, awls, pointer and creasers, embroidery hoops, lap boards, and plumb line.

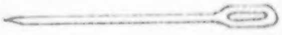
A ***needle threader*** is a diamond-shaped loop of flexible, fine wire attached to a small flat metal or plastic plate. It is used to help thread hand and machine needles. The threader is inserted through the eye of the needle; thread is then inserted through the eye of the needle threader. The threader with thread is pulled back through the needle resulting in a threaded needle.


Needle Threader

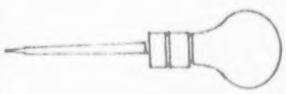
Tissue paper is a thin, flexible paper that may be used to prevent the sewing machine feed from marring certain fabrics, make pattern alterations, or transfer monograms and designs. ***Transparent tape*** can be used as a guideline for topstitching, to mend torn patterns, or to secure pattern alterations. Transparent tape also is useful for holding a zipper in place for topstitching. ***Self-sticking sewing tape*** is a special tape with measured markings on one side. It is used as a stitching guide and is especially helpful when topstiching. ***Tweezers*** can be used to remove tailor's tacks, gathering threads, basting threads, and threads or knots that accumulate in a sewing machine. ***Serger tweezers*** are used for threading and replacing serger needles and loopers.

A ***loop turner*** is a rigid wire that is approximately 10" long. It has a latch and hook device at one end to attach to the fabric and aid in turning tubing. The other end has a ring handle to hold. The loop turner is used to turn narrow tubing, straps, strips, trims, or belts. It may also be used to pull material such as elastic through a casing. A ***bodkin*** is a blunt, needle-like tool designed for pulling material or elastic through a casing. There are different types and sizes of bodkins. One type has a safety-pin type closing, and another type resembles a large-eyed needle. A third type resembles a large tweezer. The bodkin may also be used to turn narrow belts and sashes.


Loop Turner


Bodkin

An ***awl*** or ***stiletto*** is a sharp, metal tool with a wooden or plastic handle that is used to make holes for eyelets or keyhole buttonholes. The awl may also be used to punch holes in leather, plastic, or fabric or to mark placement of pockets, trim, or bands on patterns. The point is very sharp and should be covered with a snug-fitting cover for safety. Small pointed ***pliers*** are useful for straightening or mending metal trims or buckles.


Awl

The ***pointer and creaser*** is a flat tool with one end pointed and the other end rounded. The pointed end pushes out corners. The rounded end is used with the iron to flatten seam lines or assist in finger pressing. An ***embroidery hoop*** holds fabric taut for embroidery, beading, or monogramming work. A ***lap board*** for use over the arms of a chair provide a solid work surface for hand work when working in a chair instead of at a table.

A ***plumb line*** is a heavy cord with a metal weight tied to one end. It is used to check center front, center back, and side seams. For center front and back seams, seam tape is tied around the person's neck, and the plumb line is attached to the seam tape. To check side seams, the plumb line is tied to a small, flat board about

6"-by-2" in size, and the board is placed high under the arm. The plumb line provides a line for judging the direction of seams and grain lines.

PRESSING

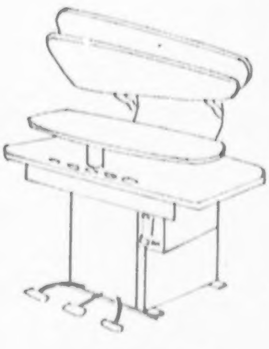
Pressing is the action of alternately pressing down and lifting up a heated iron on fabric without using any gliding movement. ***Ironing*** is the action of sliding a heated iron back and forth over fabric to smooth wrinkles. Pressing is more gentle to fabrics than ironing and does not rub finish off the surface of the fabric as ironing does.

The purpose of correctly pressing or ironing apparel and textile products is to preserve the original texture and finish of the fabric. When apparel and textile products are ironed or pressed properly, the fabric nap does not appear shiny, flat, or rough. In addition, iron marks and imprints from darts, seams, or zippers do not appear on the fabric.

Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Most custom sewers use conventional pressing equipment similar to pressing equipment used in the home. Employees in apparel manufacturing plants use commercial pressing equipment. Commercial equipment is also used by employees in commercial laundries and dry cleaners. Although the type of pressing equipment used varies in different employment situations, pressing techniques and methods of using and caring for pressing equipment are similar.

Equipment

A variety of pressing equipment is used by employees in textiles and apparel industries. The type of equipment used depends on the characteristics of the items pressed and the instructions on garment care labels. Using inappropriate pressing equipment can result in a garment with an unpleasing appearance. Failure to follow instructions on care labels can result in damage to apparel and textile products.



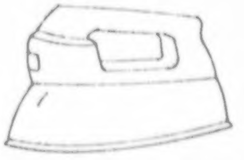
Foot Press

Types of pressing equipment include the following:

- foot press – A ***foot press*** is a two-piece padded form that applies heat, pressure, and moisture when the upper and lower pressing surfaces are activated by a foot pedal or handle. The form can be flat or curved. Similar pieces of equipment include the ***steam press*** and the ***pressing buck***. A foot press is used to press particular parts of garments such as the body of a coat or a collar, to shape and smooth garments, to improve the fit of garments, and to press creases and pleats in garments.
- pressing form – A ***pressing form*** is a collapsible fabric structure that inflates to simulate the shape of a garment. Zippers are located on the pressing form to change the size and shape of different areas. A pressing form applies heat and steam to garments and is used to press an entire garment in one operation, to set the shape of knit garments, and to press garments when hard pressing and flattened seams are not desired. Pressing forms are also used when other pressing methods would stretch or distort garments.
- portable steam presser – A ***portable steam presser*** consists of a lightweight, nonmetallic plate that tapers to a point at one end, a handle, and a chamber that holds water. When the water is heated, it emerges as steam through perforations in the plate of the presser. Portable steam pressers are used to steam garments on forms, to steam garments on hangers, to open seams and darts during the construction process, and to press fabrics that could be damaged by the pressure of a regular iron.
- electric puff iron – An ***electric puff iron*** is a small piece of pressing equipment that is operated by hand. An electric puff iron consists of an oval-

shaped metal ironing head attached to a metal stand. Attached to the stand is an adjustable clamp used to attach the puff iron to a base (such as an ironing board). Puff irons are used to press or shape contoured seams, puffed sleeves, ruffles, and pocket details.

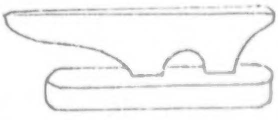
- temperature regulated iron – A ***temperature regulated iron*** consists of a handle and a weighted, flat, polished metal plate with a tapered point at one end. Temperature regulated irons have a variety of temperature settings from which to choose, and each setting maintains the chosen temperature. Temperature regulated irons are used to smooth or crease fabrics.
- steam iron – A ***steam iron*** consists of a weighted, flat, polished metal plate that tapers to a point at one end. Steam irons also have handles and chambers that hold water. When the water is heated, it emerges as steam through perforations on the bottom of the iron. Steam irons are used to smooth or crease fabrics and to set blocked muslin.
- steam iron pressure tank – A ***steam iron pressure tank*** consists of a weighted, flat, polished metal plate that tapers to a point at one end. The iron has a handle and a steam release thumb control through which steam supplied through a hose from a separate chamber is emitted. The heat and pressure in the separate chamber can be adjusted. A steam iron pressure tank is used to crease or smooth fabrics by providing a steady source of steam. It is also used when pressure and heat require adjustment for various types of fabrics.
- iron shoe – An ***iron shoe*** is a metal plate that is perforated and shaped to fit the sole of a steam iron. An iron shoe is used to prevent shine and scorching of fabric, to evenly distribute steam over the ironing surface, and to press fabrics made of manufactured fibers and fabrics such as gabardine and taffeta.
- iron stand – An ***iron stand*** is a piece of flat metal shaped like an iron. Iron stands are used to rest heated irons and to prevent the ironing surface from scorching.
- conventional ironing board – A ***conventional ironing board***, or ***small shop ironing board***, is a flat, perforated metal board that tapers at one end and is supported at table height. Conventional ironing boards are portable and are usually covered with a fitted cover made of silicone-treated fabric. The purpose of a conventional ironing board is to provide a soft, stable surface on which to press or iron.
- industrial ironing board – An ***industrial ironing board*** is a flat board that tapers at one end and is supported at table height. An industrial ironing board is padded and covered with wool, canvas, or silicone-treated fabric. The cover varies according to the type of fabric being pressed. Industrial ironing boards are permanently fixed to stands or tables and provide a soft surface on which to press or iron.
- sleeve board – A ***sleeve board*** is a small-scale, wooden ironing board with rounded ends and a padded surface covered with silicone-treated canvas or cotton fabric. Sleeve boards are used when pressing sleeves, short seams, areas that are hard to reach, and areas that will not fit on a regular ironing board. Use of a sleeve board prevents creasing that results when sleeves are pressed on a regular ironing board.
- needle board – A ***needle board***, or ***velvet board***, is a flat board covered with short, blunt wires embedded upright. Needle boards are used to prevent pile and napped fabrics, such as velvet, from being crushed, matted, or flattened during pressing or steaming.
- point presser – A ***point presser***, or ***collar board***, is a narrow, wooden form with angled edges and a tapered point. Point pressers are used to press and form sharp corners; to press open the seams of points on pockets, collars, waistbands, and lapels before they are trimmed and turned; and to press open seams without pressing nearby fabric. The base of the point presser may be used as a clapper.
- clapper – A ***clapper*** is a thick, wooden block that is rounded at one end. The terms ***pounding block*** and ***spanker*** are also used to refer to a clapper. Clappers are used to flatten darts, pleats, and seams during pressing; to flatten edges and seams on heavy fabrics such as wool; and to flatten faced edges on

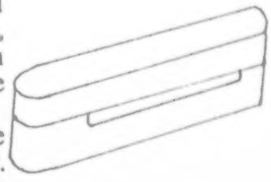

Temperature Regulated Iron

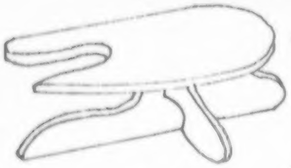
Conventional Ironing Board

Sleeve Board

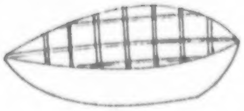
Needle Board


Point Presser

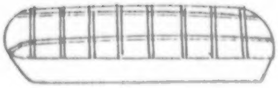

Clapper



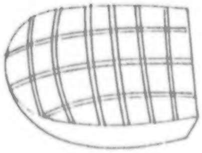
Tailor's Board



Tailor's Ham



Sleeve Roll



Press Mit

hems, collars, lapels, and buttonholes.

- tailor's board – A ***tailor's board*** is a pressing tool that is made of wood with a number of differently shaped edges and surfaces. A padded cover may be placed on the tailor's board when soft edges are needed for pressing tasks. A tailor's board is used to press flat garment areas, points, and straight and curved seams.
- seam stick – A ***seam stick*** is a half-rounded block of wood about 30" long and 3" wide that is covered with felt, cotton, or silk. Seam sticks are used to prevent impressions of seam ridges from appearing on the face of a garment.
- tailor's ham – A ***tailor's ham*** is a firm, rounded cushion covered with tightly woven fabric. A tailor's ham has a wool pressing surface and a cotton pressing surface and is used to shape collars and lapels, mold shaped areas, and press areas requiring shaping such as curved darts and seams.
- sleeve roll – A ***sleeve roll*** is a firm, cylinder shaped cushion that is covered with tightly woven fabric. Sleeve rolls consist of a wool pressing surface and a cotton pressing surface. Sleeve rolls are used when pressing sleeves, cuffs, and legs of slacks and pants to avoid misshaping garments and prevent impressions of seam ridges from appearing on the faces of garments.
- press mitt – A ***press mitt*** is a soft, glove-like cushion that can be worn on the hand or placed on a sleeve board. Press mitts are used to shape hard-to-reach areas and to press small details, rounded seams, and sleeve caps.
- pressing cloth – A ***pressing cloth*** is a square or oblong piece of wool, cotton, or linen. Pressing cloths vary in weight and are used to protect fabric surfaces when pressing, to prevent fabrics from becoming shiny when pressed, to protect ornamentation such as monograms and appliqués, and to prevent construction details such as zippers and closings from being damaged. Pressing cloths absorb sizing, starch, and other fabric finishes. Therefore, clean press cloths should be used to obtain desired results.
- pressing pad – A ***pressing pad*** is a soft pad of cotton, foam, or felt. Pressing pads are used during pressing to protect ornamentation such as monograms, embroidery, beading, lace, and appliqués.

When using commercial pressing equipment, guidelines such as the following should be observed:

- Gather all necessary supplies and place within easy reach.
- Clear the floor of the work area of debris.
- Maintain a well-lit work area (with natural lighting when possible).
- Pad pressing surfaces with materials that reflect heat into the items being pressed. Do not use materials that will scorch. ***Scorching*** occurs when the fabric surface is discolored or damaged by burning.
- Locate pressing equipment near electrical outlets so cords are not stretched excessively when equipment is used.

Procedures

When using pressing equipment, laundry and dry cleaning employees should follow set procedures. Pressing procedures have been developed that produce attractive finished products. Professional results can be achieved with conventional or commercial pressing equipment when the following guidelines are observed:

- Understand the proper use of equipment. Review instructional materials or ask for information if necessary.
- Read garment care labels and follow the pressing instructions.
- Sort items to be pressed according to fabric content. Press items requiring the lowest temperature settings first.
- Test the iron on a seam or hidden area of the garment before pressing. Adjust the temperature setting if necessary.
- Press with the grain of the fabric.
- Press on the wrong side of the fabric or use a press cloth if fabric shows a shine on the test area.

- Brush napped or heavy fabrics before pressing.
- Press the outer edges of the wrong side of the fabric first and then work toward the inside of the garment when pressing layered surfaces.
- Press fabrics made from manufactured fibers only when they are completely dry.
- Press fabrics made from natural fibers before they have dried thoroughly.
- Dampen fabrics with mist from a spray bottle if necessary.
- Do not keep the steam surface on any one area of fabric for an extended length of time.
- Check the pressing progress periodically and allow excess steam buildup to escape.
- Do not press soiled, stained, or spotted fabrics. When soiled areas are pressed, spots or stains can permanently attach to the fabric fibers rather than temporarily cling to the surface finish of the fabric.
- Do not use hot pressing equipment on buttons, zippers, sequins, glitter, feathers, rubber, or vinyl. The heat from the equipment can melt or disfigure the fabric or ornamentation.

Satisfactory results can usually be obtained when general pressing guidelines are followed. However, specific procedures should be followed when pressing pants and slacks, skirts, dresses, and blouses and shirts. Examples of procedures to follow when pressing specific garments are as follows:

- pants and slacks – Line up all four leg seams at the cuffs. Place the pants or slacks on the pressing surface so that the front creases remain lined up and are facing forward. Fold the top leg back and press the bottom leg first from the top to the hem. Turn the pants or slacks over and repeat the procedure on the other leg.
- skirts – Turn the skirt inside out and press starting on the back side. Press the waistband.
- dresses – Press collars, yokes, and shoulders first. Turn the dress inside out and press starting on the back side.
- blouses and shirts – Press from top to bottom and back to front. Next, press the underarm, chest, and stomach areas followed by the yoke, collar, and button placket areas. Press the sleeves and cuffs last in order to preserve the professionally pressed appearance.

Points to Remember

- Sewing skills, taking care of tools and equipment, and developing good working habits are all equally important aspects of employment in the apparel and textiles industries.
- Types of conventional sewing machines include straight stitch machines, zigzag machines, automatic stitch machines, and electronic or computerized machines.
- Every employee who operates a sewing machine should be familiar with the parts of the machine and how they function.
- Various parts of the conventional sewing machine help the sewer perform different tasks including the following: forming stitches, adjusting tension, adjusting stitching, threading the machine, preparing the bobbin, and raising the bobbin thread.
- Since all conventional sewing machines are somewhat different, it is important to follow the manufacturer's instructions when operating a conventional sewing machine.
- Sewing machine operators should know how to start stitching, control the machine's speed, and stop smoothly at the desired spot.
- Types of industrial sewing machines include lock stitch, chain stitch, automatic, and decorative-stitch machines.
- Many parts and functions of conventional sewing machines are similar to those of industrial sewing machines. However, there are additional features on industrial machines that cause them to function differently than conventional machines. Additional features found on many industrial machines include the treadle, knee press, balance wheel, belt, thread stand, and sewing lamp.
- Various types of sewing machine attachments are available for both conventional and industrial sewing machines. Attachments include the following: presser feet, width gauges and edge guides, hemmers, folders, lapped seam attachments, cutting and trimming attachments, attachments for adding trim, cording and welting attachments, pleating attachments, and gathering and shirring attachments.
- It is important to keep sewing machines in good condition by cleaning, oiling, and servicing them regularly. The regularity of cleaning a sewing machine depends on how much it is used. Machines used daily should be cleaned each day. Manufacturer's instructions and general maintenance guidelines should be followed for caring for sewing machines.
- Sewing machine operators should be alert to notice warning signals that indicate the need for sewing machine repairs.
- A variety of miscellaneous equipment and tools are used for different sewing tasks.
- Pressing is the action of alternately pressing down and lifting up a heated iron on fabric without using any gliding movement. Ironing is the action of sliding a heated iron back and forth over fabric to smooth wrinkles. Pressing is more gentle to fabric than ironing.
- Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Both conventional and commercial pressing equipment require similar pressing techniques and methods of use and care.

Words to Know

- attachment
- automated cutting systems
- automatic stitch sewing machine
- awl
- balance wheel
- ballpoint needle
- bed
- bed-type width gauge
- belt
- bent-handled shears
- bight
- binder
- blindstitch machine
- bobbin
- bobbin case
- bobbin winder
- bodkin
- bottom covering chain stitch machine
- built-in bobbin case
- butterfly gauge
- button foot
- button sewer
- buttonhole foot
- buttonhole machine
- buttonhole scissors
- cam
- chain stitch sewing machines
- chopper-type pinker
- clapper
- collar board
- computerized sewing machines
- conventional ironing board
- conventional sewing machines
- cording and welting attachment
- cording foot
- cut-after buttonholes
- cut-before buttonholes
- cutter
- cutting
- cutting board
- decorative stitch machine
- double needle
- double-margin gauge
- dressmaker's carbon paper
- dressmaker's marking pencil
- dressmaker's marking pens
- drill holes
- drop-in bobbin
- edge guide
- electric puff iron
- electric shears
- electronic sewing machines
- embroidery foot
- embroidery hoop
- embroidery scissors
- emery bag
- fabric trimmer
- feed
- flywheel
- folder
- pinking shears
- pleating attachment
- pliers
- plumb line
- point presser
- pointer and creaser
- portable steam presser
- position marking
- pounding block
- press mitt
- presser foot
- presser foot lever
- pressing
- pressing buck
- pressing cloth
- pressing form
- pressing pad
- pressure
- pressure regulator
- removable bobbin case
- removable-case bobbin
- reverse stitch control
- rolled-edge hemmer
- rotary pinker
- ruffle
- ruffler attachment
- scorching
- seam rippers
- seam stick
- self-stitching sewing tape
- serger
- serger tweezers
- sewing lamp
- sewing scissors
- sharp needle
- shears
- shirring
- shuttle hook
- single-needle lock stitch machine
- single-setting gauge
- single-thread chain stitch machine
- sleeve board
- sleeve roll
- slide plate
- small shop ironing board
- spanker
- special drop-in bobbin
- spool pin
- spread
- spreading
- spreading machine
- stand
- steam iron
- steam iron pressure tank
- steam press
- stiletto
- stitch length control
- stitch regulator
- stitch width control
- stop motion screw

folding hemmer
foot press
foot-type width gauge
gathering
gathering foot
general purpose needle
handwheel
head
hemmer
hopper
industrial ironing board
industrial sewing machines
invisible zipper foot
iron shoe
iron stand
ironing
knee press
knife attachment
lap board
lapped seam attachments
laser cutting
lay
lock stitch sewing machines
lock stitch tacker
loop spreader
loop turner
looper
machine driving pulley
marking for shade
motor
multi-margin gauge
multi-needle lock stitch machine
needle bar
needle board
needle clamp screw
needle plate
needle position control
needle threader
overedge foot
overedge machine
overlocker
pin cushions
straight-handled shears
straight pins
straight stitch foot
straight stitch sewing machine
table
tailor's board
tailor's chalk
tailor's ham
tailor's tack marker
tailor's tacks
tailor's wax
take-up lever
temperature regulated iron
tension assembly
tension dial
tension discs
thread clippers
thread cutters
thread guides
thread scissors
thread stand
throat plate
tissue paper
top-and-bottom covering chain stitch machine
tracing wheel
transparent tape
treadle
trimming scissors
triple needle
tweezers
twin needle
two-thread chain stitch machine
velvet board
water jet cutting
wedge-shaped needle
width gauge
zigzag foot
zigzag lock stitch machine
zigzag sewing machine
zipper foot

Questions for Review

1. What are the four types of conventional sewing machines and what are the differences in them?
2. What major sewing machine parts are involved in the formation of stitches? How are stitches formed?
3. How should one adjust the tension and the stitching on a conventional sewing machine?
4. What different types of sewing machine needles are available? What procedures are used to insert a needle into a sewing machine?
5. What different types of bobbins and bobbin cases are used in different sewing machines? How is a bobbin prepared for use?
6. What are the differences in chain stitch and lock stitch sewing machines?

7. What functions are performed by the various types of automatic industrial sewing machines?

8. What are the functions of different types of presser feet?

9. What are examples of other types of sewing machine attachments besides presser feet? What are the functions of these attachments?

10. How does one decide how frequently to clean a sewing machine?

11. Why is it important to check the oil level frequently on an industrial sewing machine? How is the oil level checked?

12. What are examples of warning signals that a sewing machine may need repair?

13. How is the process of spreading and cutting fabric performed in an apparel manufacturing setting?

14. What is the difference in scissors and shears? What different types of scissors and shears are available?

15. What types of marking equipment are used in apparel manufacturing?

16. What are the functions of the following marking tools: tracing wheel, dressmaker's carbon paper, tailor's chalk, tailor's wax, dressmaker's marking pencil, dressmaker's marking pens, straight pins, and pin cushions?

17. Why is it important to follow care labels on garments when pressing them?

18. What are five major guidelines to observe when using conventional and commercial pressing equipment?

20

Receiving, Marking, and Identifying Laundry and Dry Cleaning

ESSENTIAL ELEMENT

- Demonstrate procedures to receive, mark, and identify laundry or dry cleaning.(q10A)

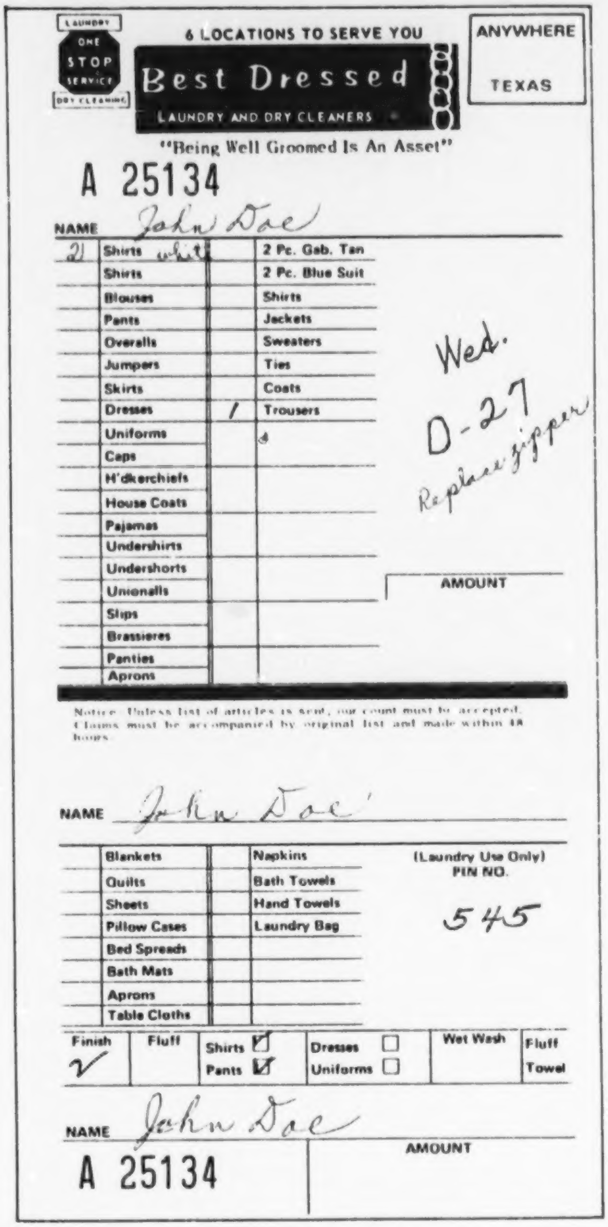
OBJECTIVES TO ACHIEVE

- Outline general procedures for receiving, marking, and identifying laundry.
- Identify general procedures for receiving, marking, and identifying dry cleaning.

Employees of laundries and dry cleaners are responsible for caring for customers' apparel and textile products. Employees should be trained to follow certain procedures for receiving, marking, and identifying laundry and dry cleaning in order to reduce the risk of damaging or misplacing items. When proper procedures are followed, customers are satisfied with the results, and dry cleaners or laundries receive repeat business which results in increased profits. It is important to remember that procedures for receiving, marking, and identifying laundry and dry cleaning differ among businesses. Therefore, employees should learn and follow the procedures of the place of employment.

RECEIVING, MARKING, AND IDENTIFYING LAUNDRY

Many individuals choose to have apparel and textile products cleaned by a commercial laundry. A ***commercial laundry*** is a place of business where apparel and textile products are laundered for a fee. Customers may take apparel and textile products directly to the laundry or to a laundry drop-off center. A ***laundry drop-off center*** is a location where customers drop off and pickup laundry. No actual laundering is performed at a laundry drop-off center. Apparel and textile products are taken to another location to be laundered. When receiving apparel and textile products, employees should ask customers what type of laundering services they desire. In addition, customers should be asked to point out any spots or stains on items and describe what caused the stains. This information is usually recorded on a ticket such as the one shown in figure 20.1.



LAUNDRY
ONE STOP SERVICE
DRY CLEANING

6 LOCATIONS TO SERVE YOU

Best Dressed
LAUNDRY AND DRY CLEANERS

ANYWHERE
TEXAS

"Being Well Groomed Is An Asset"

A 25134

NAME John Doe

21	Shirts white		2 Pc. Gab. Tan
	Shirts		2 Pc. Blue Suit
	Blouses		Shirts
	Pants		Jackets
	Overalls		Sweaters
	Jumpers		Ties
	Skirts		Coats
	Dresses	/	Trousers
	Uniforms		
	Caps		
	H'dkerchiefs		
	House Coats		
	Pajamas		
	Undershirts		
	Undershorts		
	Unionalls		
	Slips		
	Brassieres		
	Panties		
	Aprons		

Wed.
D-27
Replace zipper

AMOUNT

Notice: Unless list of articles is sent, our count must be accepted. Claims must be accompanied by original list and made within 48 hours.

NAME John Doe

	Blankets		Napkins
	Quilts		Bath Towels
	Sheets		Hand Towels
	Pillow Cases		Laundry Bag
	Bed Spreads		
	Bath Mats		
	Aprons		
	Table Cloths		

(Laundry Use Only)
PIN NO.
545

Finish	Fluff			Wet Wash	Fluff Towel
✓		Shirts ☑ Pants ☑	Dresses ☐ Uniforms ☐		

NAME John Doe

A 25134

AMOUNT

Figure 20.1

Explaining Costs

Before a customer leaves a laundry or laundry drop-off center, an employee may explain the pricing systems. Some commercial laundries charge by weight and others charge per item. For example, one laundry may weigh a basket of apparel and textile products and charge one price for laundering the entire basket. Another laundry may only launder specific items such as shirts, slacks, and sweaters. Commercial laundries that only launder certain items are more likely to charge a specific price for each item that is laundered rather than one price for an entire load.

BEST COPY AVAILABLE

In commercial laundries where the fee is based on weight, apparel and textile products are often laundered using methods similar to methods used to wash items in the home. Items are sorted, washed, dried, and folded or hung. Special services such as the following usually are not included in the laundering price:

- ***pretreating*** – using stain removal products to remove stains from items before they are laundered
- ***sizing*** – applying a liquid to a garment to achieve a smooth, matte finish
- ***pressing*** – using a heated instrument to remove wrinkles from fabrics without using any gliding action

Special treatments such as those described may be available, but usually customers must pay an additional fee to have them provided.

In laundries where a specific price is charged for each item laundered, an additional fee is usually not charged for special treatments. Since an additional fee for special treatments is not charged, however, the price for laundering may be higher.

Labeling and Sorting

The apparel and textile products a customer leaves at a laundry or laundry drop-off center usually are labeled or identified in at least two ways to ensure that they are returned to the correct owner after laundering. In some laundries, the customer's name is written in indelible ink on an inconspicuous place on each item, such as an inside seam. ***Indelible ink*** is permanent and cannot be removed during the cleaning process. Some laundries tag apparel and textile products with a number that corresponds to the number on the receipt given to the customer when items are dropped off.

When customers drop off apparel and textile products, they often identify soiling materials that have caused stains. ***Soiling materials*** are liquids and solids that attach to the fibers of a fabric and produce a stain. Laundry employees who receive soiled apparel and textile products should tag the soiled areas immediately. The tags should identify the soiling materials and their locations on the items. When stains are tagged, apparel and textile products can be treated properly when laundered. Some laundries tag stained items with color-coded tags that correspond to various types of common soiling materials such as grease, oil, and protein.

After apparel and textile products are labeled, they are usually sorted. Apparel and textile products that are laundered at another location, however, may not be sorted at a laundry drop-off center. At a laundry drop-off center, unsorted apparel and textile products are placed in a deposit cart and taken to another location for sorting and laundering. When apparel and textile products are laundered where the customer drops them off, employees sort them according to characteristics such as color, texture, weight of fabric, and type of soil. Apparel and textile products must be sorted properly in order to avoid damage during laundering. Once apparel and textile products are accurately identified and sorted correctly, they are ready for laundering.

RECEIVING, MARKING, AND IDENTIFYING DRY CLEANING

When customers drop off apparel and textile products at commercial dry cleaning establishments, the procedures followed are similar to those followed when items are dropped off at laundries. Employees ask customers questions similar to those asked at laundries and complete tickets such as the one shown in figure 20.1. Employees ask what type of dry cleaning services are desired and then explain the costs for the services. Customers should also be asked to identify any soiling materials that may have stained their apparel and textile products. When customers identify soiling materials, employees should properly tag items.

Types of Dry Cleaning Services

Customers often do not realize that there are a variety of dry cleaning services available. Dry cleaning employees who receive apparel and textile products must understand each type of dry cleaning service offered and be able to properly explain the services to customers. Once customers understand the types of services offered, they can make informed decisions about how they wish to have their belongings dry cleaned. Once a dry cleaning service is chosen, employees should tag the apparel and textile products appropriately.

Before customers leave dry cleaning establishments, employees should ask if they would like any additional finishing services. Dry cleaners often replace sizing and other fabric finishes. A ***finish*** is a treatment or process used to improve different fabric characteristics. Employees should also ask customers if they would like any minor damage to apparel and textile products repaired. Dry cleaners often mend torn seams, repair broken zippers, and replace missing buttons. However, there may be an additional charge for these services.

After determining how customers wish to have their apparel and textile products dry cleaned, employees should explain when the items will be ready for pickup. In addition, the customer should be politely thanked for choosing the dry cleaning establishment.

Sorting and Separating Dry Cleaning

When apparel and textile products are dry-cleaned at a drop-off center, employees sort the items according to the type of fabric, color of fabric, and degree of soiling. If apparel and textile products are dry-cleaned at a dry cleaning plant, sorting is done when the items are delivered to the plant. A ***dry cleaning plant*** is a central location where dry cleaning processes are performed.

When sorting apparel and textile products, employees should fasten buttons, close zippers, empty pockets, and remove any ornamentation. ***Ornamentation*** is a decorative item, such as a feather or pin, that is used to accessorize apparel and textile products. Items found in the pockets of clothing and ornamentation that is removed should be placed in an envelope labeled with the customer's name. The envelope should be returned to the customer when apparel and textile products are picked up.

Ornamentation is usually delicate and cannot withstand dry cleaning solvents or mechanical cleaning action. Therefore, it is important to remove ornamentation from apparel and textile products before dry cleaning. Ornamentation should also be removed so that it is not lost. Since the apparel and textile products of several customers are dry cleaned together, it can be difficult to correctly match items with ornamentation that is unattached.

Some businesses offer both commercial laundry and dry cleaning services. Individuals employed by this type of business must be attentive when customers explain the type of cleaning services they desire. Customers routinely request that some items be laundered and others be dry cleaned. Sometimes customers are unsure about which cleaning service will meet their needs. Customers usually follow the advice they are given when they drop off their apparel and textile products. Therefore, employees must be able to give advice based upon a thorough understanding of the cleaning options available.

Self-Service Dry Cleaning

Sometimes dry cleaners provide self-service dry cleaning machines for use by customers. A ***self-service dry cleaning machine*** is similar to a coin-operated washing machine in a laundromat. Apparel and textile products are placed in the dry cleaning machine and tumbled in nonflammable dry cleaning solvent. Customers may need the assistance of a dry cleaning attendant in purchasing cleaning fluids and operating the machine. Employees should learn how to operate self-service dry cleaning machines and be able to explain their use quickly and thoroughly. The cost of self-service dry cleaning is less than professional dry cleaning. However, services such as spotting, mending, and pressing are not available.

Points to Remember

- Employees should ask customers to point out stains on apparel and textile products and identify soiling materials.
- Some laundries charge a fee to launder an entire basket of apparel and textile products while others charge a set fee per item.
- Laundry fees based on the weight of a basket of apparel and textile products usually do not include fees for special services such as prespotting, sizing, and pressing.
- All apparel and textile products that are left to be cleaned are usually labeled and identified in at least two ways to ensure that they are returned to the owner after cleaning.
- When apparel and textile products are cleaned at a laundry drop-off center, they are sorted according to characteristics such as color, texture, weight of fabric, and type of soil before being laundered.
- Dry cleaning employees should ask customers if they desire additional services such as the replacement of sizing or other fabric finishes.
- Dry cleaners often mend torn seams, repair broken zippers, and replace missing buttons; however, there may be an additional charge for these services.
- Ornamentation should be removed from apparel and textile products before cleaning since it is delicate and usually cannot withstand cleaning solvents or mechanical cleaning action.

Words to Know

commercial laundry
dry cleaning plant
finish
indelible ink
laundry drop-off center
ornamentation
pressing
pretreating
self-service dry cleaning machine
sizing
soiling materials

Questions for Review

1. Why should employees ask customers to identify and point out the locations of stains on apparel and textile products?
2. Why do commercial laundries and dry cleaners often operate several drop-off centers but only one cleaning operation?
3. How do the laundry services provided by laundries that charge by weight usually differ from the laundry services provided by laundries that charge per item?
4. Why is it important for employees to label a customer's apparel and textile products in more than one way?
5. Why should ornamentation be removed before apparel and textile products are cleaned?
6. How does self-service dry cleaning differ from professional dry cleaning?

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Laundry and Dry Cleaning Procedures

ESSENTIAL ELEMENTS

- Determine appropriate laundry and dry cleaning procedures.(q10B)
- Demonstrate commercial laundry or dry cleaning techniques.(q10D)

OBJECTIVES TO ACHIEVE

- Compare a variety of laundry products.
- Explain the importance of prelaundry procedures such as sorting and stain removal.
- Differentiate between the functions of mechanical energy, chemical energy, and thermal energy.
- Understand the operation of commercial washers and dryers.
- Outline procedures to follow before dry-cleaning apparel and textile products.
- Understand the operation of commercial dry cleaning equipment.

The goal of laundry and dry cleaning employees is to remove soil and provide customers with clean apparel and textile products. When choosing the most appropriate method for removing soil from apparel and textile products, employees should consider characteristics of the items being cleaned and follow instructions on care labels.

Apparel and textile products can be damaged when inappropriate cleaning methods are used. For example, if apparel and textile products are not checked for colorfastness, they may bleed and damage other items. Additional characteristics to be considered when cleaning apparel and textile products include the following:

- fiber content
- yarn structure
- fabric construction
- garment design and construction

- fabric finish(es)
- type of trim
- type and amount of soil

Employees should also have a thorough knowledge of laundry and dry cleaning equipment and products. Proper use of equipment and supplies can eliminate damage to apparel and textile products.

COMMERCIAL LAUNDERING

Procedures and techniques used in commercial laundries to launder apparel and textile products are similar to laundering procedures used in the home. Apparel and textile products are sorted, stains are removed, and items are washed and dried. However, the equipment used in commercial laundries differs from home laundry equipment. The large amount of apparel and textile products laundered in a commercial laundry requires the use of large, commercial laundering equipment.

In order to properly launder a customer's apparel and textile products, it is important for an employee to understand various aspects of laundering such as the following:

- correct use of various types of laundry products
- procedures for properly sorting laundry
- techniques for removing stains
- operation of laundry equipment

Laundry Products

Laundering not only cleans but also removes odors, reduces wrinkles, restores a fresh appearance, and preserves the lives of apparel and textile products. In order to achieve these results, one must select and use appropriate laundry products. Suppliers usually provide information on ingredients, proper application, and safe use of products. In addition, many suppliers or manufacturers also offer training sessions regarding the use and application of their products.

Each laundry employee must be thoroughly trained in the correct use of laundry products. The amount of a laundry product used is just as important as the type of product used. The amount of detergent, bleach, or other product is determined by the size of the load and the amount of water used in the wash cycle. Effective results can usually be achieved by following the manufacturer's recommendations.

Some laundry products contain a combination of ingredients while other products must be mixed to achieve effective results. Some laundry products become dangerous when combined. Other products come premixed and packaged in properly proportioned amounts for easy and safe use. Knowledge of laundry products and laundry product ingredients is important not only in achieving the most effective use of a product but also in assuring the safety of the user.

Products used to launder apparel and textile products should be tested regularly to determine the pH level. The ***pH level*** indicates the acidity or alkalinity of a solution. A pH value of seven is neutral. Values from zero to seven indicate acidity, and values from seven to fourteen indicate alkalinity. If the pH level of a laundry product is too high or too low on the scale, apparel and textile products may become discolored and skin irritation can result. A kit that determines the pH level in the final rinse water can be purchased and used to test laundry products.

Guidelines to observe when using laundry products include the following:

- Use enough laundry product to effectively clean laundry. Poor results are achieved when an insufficient amount of laundry product is used.
- Add extra laundry product when hard water or heavy soil is present, large loads are washed, or wash water is cool.
- Use detergents rather than soap in hard water. Soap reacts with the minerals in hard water to form a soap curd that makes apparel and textile products appear dull and dingy.
- Use either soap or detergent in soft water.
- Use hot water when possible. All detergents, even those designed to work in cold water, give better results when used in hot water.
- Read all package directions and measure precise amounts, especially when using bleach.
- Dilute bleach and fabric softeners before adding to wash or rinse water to avoid staining or discoloring apparel and textile products.

Presoak Products – A ***presoak product*** is used to create a solution in which stained items are soaked before being laundered. Presoak products contain enzymes or oxygen bleach. An enzyme is a substance that speeds up a chemical reaction. Enzyme presoaks aid in breaking down complex soils, especially proteins such as egg and blood, so these soils can be more easily removed by other detergent ingredients during the laundering process. Presoaks can also be placed directly on stains.

Soaps – ***Soap*** is a mild cleaning product made by combining a strong alkali, such as lye, with animal fat. An ***alkali*** is a soluble substance that neutralizes acids. Soap should only be used as a laundry product when washing with soft water. When soap combines with minerals found in hard water, a soap curd is produced.

Soap curd is a sticky yellow or white crust that deposits on fabrics and washing machines. Soap curd deposits cause apparel and textile products to appear dull and dingy. When soap is used in hard water, a water softening agent should be added to both wash and rinse waters to help prevent soap curd deposits. When used alone, soaps are too neutral to provide effective cleaning power. However, they can safely be used to pretreat stains and hand wash delicate fabrics.

Detergents – Laundry detergents are available in many different types and forms. Each type contains basic ingredients that perform specific tasks during the washing process. Detergents may contain surfactants, builders, dyes, bleach, softeners, antiredeposit agents, and suds control agents.

A ***surfactant*** improves the wetting ability of water, loosens and removes soils with the aid of mechanical action (such as washer agitation or manual scrubbing), and dissolves or suspends soils in the water so they are not redeposited on fabrics. High-sudsing surfactants are particularly effective in the removal of oil and dirt.

A ***suds control agent*** is used in laundry detergents to control the amount of suds produced during the washing process. Low-sudsing detergents were originally designed for use in tumble-type automatic washers where excess suds interfered with the cleaning action of the washer.

Builders increase the efficiency of cleaning agents by tying up or inactivating minerals in hard water. All granular laundry detergents and some liquid laundry detergents contain builders. Phosphate, an alkali, is used as a builder. Phosphate has the ability to sequester (surround and seize) water hardness minerals and hold them tightly in solution. Phosphates aid in the removal of soils and keep them from redepositing on fabrics.

In some geographical areas, phosphates are banned because it is believed they contribute to the eutrophication of streams and rivers ***Eutrophication*** refers to increased levels of nutrients in a body of water. An increased level of nutrients causes the rapid growth of algae. As algae decays, oxygen levels in the water decrease, and fish die. The eutrophication process can be reversed by properly treating and disposing of waste water and reducing runoff.

The amount of detergent used depends upon water softness. Commercial laundries using hard water may choose to mechanically soften water, increase the amount of detergent used, or add water softeners during the washing process. Decisions regarding water softness are usually made on the basis of cost-effectiveness.

Bleaches – ***Bleach*** is a laundry product used to whiten, remove stains, remove oily soils, deodorize, and disinfect. Both chlorine and oxygen-based bleaches are available in liquid or powder form.

Chlorine bleach is available in liquid or granular form and can be used on all washable, colorfast cotton and permanent-press fabrics. Chlorine bleach should always be diluted. When chlorine bleach is not diluted, color may be removed from fabrics or fabrics may be weakened. Chlorine bleach may cause fabrics to discolor if an excessive amount of iron is present in the water supply. Some fabrics may have a chlorine retentive finish. These fabrics can turn yellow when chlorine bleach is used in the washing process. A packaged color remover must be used to remove yellowing.

Oxygen-based bleach provides bleaching action for stain and soil removal and can be used on all colored, washable fabrics. Oxygen bleaches usually contain other cleaning ingredients such as water softeners, enzymes, and fabric whitening agents. Oxygen-based bleaches are milder than chlorine bleaches and work best in hot water or in a soak. Chlorine and oxygen-based bleaches should not be mixed. When mixed, the actions of the bleaches counteract each other and effective results are not produced.

Bluing is a liquid or powder added to laundry solutions to prevent white fabrics from yellowing. Laundry detergents often contain bluing formulations that add a desirable blue-white color to white fabrics. Most detergents contain ***fluorescent whitening agents*** (***FWAs***) rather than bluing. FWAs are complex organic molecules that adhere to fabrics as a dye would. They absorb unseen ultraviolet rays from the sun or fluorescent light sources and convert this energy to visible light to enhance fabric appearance and maintain whiteness or brightness. FWAs are found in presoaks, liquid fabric softeners, detergent boosters, and oxygen bleaches.

When using bleach, the following guidelines should be observed:

- Read directions and measure bleach accurately.
- Do not pour bleach directly on laundry.
- Dilute liquid chlorine bleach with water before adding to agitating laundry.
- Do not combine undiluted chlorine bleach and undiluted liquid detergent. Harmful fumes may be produced.
- Avoid adding chlorine bleach and enzyme detergent to wash water at the same time. Chlorine bleach inactivates enzymes.
- Do not mix chlorine bleach with ammonia or acids such as vinegar or rust remover. Mixing chlorine bleach with acid can produce a toxic gas that may cause death.
- Bleach an entire item rather than only stained areas so any color change will be less noticeable.

Fabric Softeners – A ***fabric softener*** is a product that is used during the laundry process to give laundry a soft, smooth feeling, to make pressing easier, and to prevent static electricity. Fabric softeners also add a pleasing fragrance to laundered articles and reduce wrinkling. Fabric softeners are available in liquid form, saturated paper or fabric sheets, and packets.

Liquid fabric softeners are added directly to the final rinse. Many washing machines have dispensers that automatically dispense fabric softener. Fabric softener should not be poured directly on fabrics since staining will occur. Fabric softener stains can be removed by wetting the stain and rubbing it with bar soap.

Sheet or packet fabric softeners are placed in the dryer with laundry. At high temperatures, sheets or packets can cause staining. Wet bar soap can be applied to remove stains.

Starches – ***Starch*** is used to give body to fabrics made of natural fibers, increase resistance to soiling, and make pressing easier. Starch is available in liquid, spray, or powder form. Starch is often added to the washer during the final rinse cycle or applied before or during pressing. Dry or liquid starch is mixed with hot or cold water. In commercial laundries, a special washer is often used for applying starch.

Prelaundry Procedures

Sorting – ***Sorting*** is the process of separating items to be washed into groups that can be washed together safely. Apparel and textile products should be sorted into a minimum number of categories. Too many categories result in small loads and underfilled washing machines. However, too few categories result in large loads that lower the quality of each washing. The sorting method used in a commercial laundry should help the work proceed quickly and efficiently.

Apparel and textile products are often sorted according to the following:
- color – Dark and light colored items should be laundered separately since dark colored items can bleed and damage light colored items.
- soil – Heavily soiled items should be laundered separately from moderately or lightly soiled items to ensure that the soil is adequately removed.
- size – Items of similar size should be laundered together to prevent heavy items from damaging delicate items.
- texture – Items that shed lint, such as towels, should not be washed with items that collect lint, such as fabrics made of manufactured fibers, permanent-press fabrics, and napped fabrics such as corduroy and velveteen.

Apparel and textile products are also sorted according to the type of handling required following the laundry process. For example, laundry could be sorted into categories such as the following:
- items that will be removed from the washer and ironed dry
- items that will be tumbled dry
- items that require starch

As laundry is sorted, employees should check pockets, close zippers, fasten closures such as buttons and snaps, and remove ornamentation. Adequately preparing apparel and textile products for laundering helps prevent damage such as snagging. Some commercial laundries require employees to repair damaged items before laundering. Damage that is not repaired can ravel and become worse during the washing process. Employees should be familiar with procedures for repairing apparel and textile products. Further information regarding the repair of apparel and textile products is included in Chapter Nine.

General guidelines to observe when sorting laundry include the following:
- Sort laundry on a table or counter to save energy and time.
- Wash like items together to prevent tangling and excess wrinkling and to control load weight.

- Wash white, brightly colored, colorfast, and noncolorfast items separately.
- Wash heavy, bulky items such as blankets and bedspreads by themselves.
- Do not wash colored fabrics with lint shedding fabrics. Lint is difficult to remove from colored fabrics.

Stain Removal – Any item that is stained or heavily soiled requires special treatment before being laundered. ***Soiling*** means to make dirty. ***Stains*** are soiled or discolored spots. Identification of a stain is necessary before the correct treatment can be applied. Immediate action is also important in removing stains. Three basic methods used to treat stains are soaking, pretreating, and stain removal.

Many stains can be removed by soaking them in a basin, laundry sink, or washer filled with warm or cool water and a presoak product containing enzymes. Hot water should not be used since it tends to set protein stains. Soaking is effective in removing stains such as egg, baby formula, chocolate, grass, blood, and body soil. The soaking time depends on the type of fabric, the age of the stain, and the amount of stain. Most items should be soaked at least thirty minutes, but problem stains can be soaked overnight. Soaking is recommended for heavily soiled, yellowed, or grayed fabrics. Excess solution should be removed from soaked items before items are laundered. Small, greasy areas can be presoaked using a degreaser solution or spray prior to washing.

Pretreating is an effective way to treat small stains, soil inside cuffs and collars of uniforms, and grease spots on permanent-press fabrics. When pretreating, stain remover should be applied to the back of a stain rather than the front. This method helps push the stain off of the surface rather than force it into the fabric.

Stain removal involves removing stains before items are laundered. Laundry employees should be familiar with a variety of fabrics and should have access to a stain removal guide and stain removal kit. A ***stain removal kit*** contains treatment solutions such as enzyme treatment, neutral detergent, nonflammable dry cleaning solvent, ammonia, denatured alcohol, white vinegar, and rust remover; clean, white towels; a putty knife; and a soft-bristled scrub brush. Employees should receive training regarding the effective use of stain removal techniques.

When removing a stain, one should first determine the cause of the stain. This is important since different methods are used to remove different types of stains. It is important to begin working slightly outside the stain and work in a circular motion toward the stain's center. This prevents the stain from spreading. A blotting motion rather than a rubbing motion should be used since rubbing motions can damage fabric. Overwetting should be avoided since this may cause fabric to shrink. Once the stain is removed, the same procedure should be used to rinse the fabric with clear water. After rinsing, the fabric should be allowed to air dry. If the stain is not completely removed, the procedure should be repeated. Once a stain is removed, the fabric should be laundered. Most stains can be removed following this procedure. Methods for removing common stains from washable fabrics are included in table 21.1.

When using a stain remover, one should always test it on an inconspicuous area of the fabric before treating the stain. The following procedure can be used to test stain removers:

- Apply the amount of stain remover recommended on the package.
- Allow the stain remover to remain on the fabric sample for the recommended amount of time.
- Rinse the stain remover from the fabric.
- Examine the area and look for any change in color or texture of the fabric. If any changes appear, do not use the stain remover on the fabric.

Some stains remain on fabrics even after presoaking and applying stain removal products. These stains may be removed by either flushing or tamping. ***Flushing*** is the pouring of water or another stain removal liquid over a stain in an effort to release the stain from the fabric. Flushing removes both stains and stain removal products that were unsuccessful. ***Tamping*** is the use of a soft, densely bristled brush to brush a stain out of fabric. Light brushing action should be used (the brush bristles should not bend) to prevent damage to fabric.

The Washing Process

Three forms of energy are necessary to remove soil from fabric: mechanical, chemical, and thermal. ***Mechanical energy*** is supplied by the washing action of the washing machine; ***chemical energy*** is supplied by bleach, detergents, and other laundry products; and ***thermal energy*** is supplied by warm or hot water. If one source of energy is reduced, one of the other sources of energy must be increased to maintain the same level of laundering performance.

Mechanical Energy – Mechanical energy is provided by the rotation of the agitator or tub. Agitation is necessary for cleaning, but too much agitation can result in damage to fabrics and the construction of apparel and textile products. Most washers offer a choice of agitation speeds. The types of fabrics being washed determine whether the agitation speed should be normal or slow and gentle. Agitation speed, load size, water level, and operation time can increase or decrease the effectiveness of mechanical energy.

Mechanical energy or the length of the wash cycle can be increased to compensate for reduced water temperature (thermal energy). Increased wash time, however, can reach a point of diminishing return and can increase fabric abrasion.

Chemical Energy – Chemical energy can be increased by pretreating, soaking, and adding more laundry product. In some geographic areas, detergent effectiveness has been reduced because of laws banning the sale of phosphate detergent. Removing phosphates reduces the effectiveness of detergents.

The following four basic processes dissolve and remove soil:

- wetting – ***Wetting*** is the first step in cleaning. By itself, water tends to form droplets and rest on top of the surface without penetrating soil. Laundry products contain a surface active agent (surfactant) which makes the water spread out evenly and allows the cleaning solution to get in between the soil and the surface. This process loosens and removes the soil.
- emulsifying – Fats, oils, and greasy soils are difficult to dissolve. ***Emulsifiers*** are chemicals that break fats, oils, and greasy soils into tiny particles so they can be easily removed from the surface and kept suspended in the wash solution until rinsed away. Emulsification is the action of an alkali or soap which breaks up the globules of grease and oil into very small particles and keeps them separated so that they do not reform into a solid group until they are rinsed out of the load.
- dispersing – Dispersing is similar to emulsifying, but ***dispersing*** breaks up solid soil and keeps it finely divided and suspended until it can be rinsed away. Solid dirt such as carbon, dust, earth, and clay is difficult to remove from fabrics. Solid soil firmly holds onto the fabric and is often ground into it. Water alone will not remove solid soil, but soaking in soap and water gradually lifts soil off and suspends it. This action is very slow, but it is speeded up by mechanical action and the use of alkalies. Alkalies prevent the dirt from being redeposited.
- sequestering – ***Sequestering*** is a chemical reaction that overcomes the effect of the minerals in water. Certain laundry products have the ability to sequester certain water minerals that otherwise would prevent other laundry product ingredients from dissolving and removing soil.

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Deodorant Perspiration Urine	Sponge with detergent. Launder in water temperature and bleach appropriate for the fabric type. Color may or may not be restored by sponging fresh stains with ammonia and old stains with vinegar. Dilute ammonia with an equal amount of water if used on wool, mohair, or silk. Rinse.
Fabric Softener	Rub black spots with detergent and launder. For a gray or bluish buildup, soak in detergent and bleach appropriate for the fabric; launder.
Fingernail Polish	Sponge white cotton fabric with nail polish remover. Sponge other fabrics with amyl acetate (banana oil). Launder. Repeat if necessary.
Fruits Juices	Sponge immediately with cool water. If safe for fabric, pour boiling water through stain. Work detergent into stain; rinse. Bleach safe for fabric type may remove final traces.
Grass	Work detergent into the stain and rinse. If colorfast, moisten with alcohol. If colorfastness is questionable or fabric is acetate, dilute alcohol with two parts water.
Laundry Product	Soak in one part vinegar to four parts water in a plastic container.
Mildew	Moisten with lemon juice and salt, if safe for fabric, and allow to dry in the sun, or sponge with hydrogen peroxide.
Mimeograph Fluid	Sponge with alcohol, turpentine, or nail polish remover depending upon the type of fluid and fabric.
Mud	Let dry and brush. Soak in cold water with detergent. For iron clay soils, remove the same as rust. If stain remains, sponge with alcohol.
Mustard	Work glycerine into stain. Rinse. Launder. Prolonged soaking may be necessary. If stain remains, sponge with alcohol.
Paint Varnish	Treat the stain before it dries, if possible. Sponge with thinner solvent recommended on the label, turpentine, or trichloroethane. While still wet with solvent, apply detergent and soak. Launder. Repeat if necessary. Stain may be impossible to remove.
Rust	Sprinkle salt on the stain and moisten with lemon juice if safe for fabric. Dry in the sun and rinse. Repeat if necessary. Commercial rust or color removers may be used as directed. Do not use chlorine bleach.

Table 21.1

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Adhesive Tape Chewing Gum Rubber Cement	Harden by rubbing with ice. Remove excess gummy matter carefully with a putty knife. Remove remaining stain with a safe cleaning fluid.
Asphalt Tar	Pour trichloroethane through the fabric. Repeat. Rinse and launder. Some stains may be impossible to remove.
Beverages (alcoholic and soft drinks) Perfumes	Sponge with cool water and glycerine. Soak 30 minutes. Treat with detergent. Sponge with alcohol if safe for fabric.
Blood Carbon Paper (regular) Pencil (lead)	Sponge with cool water. Soak 30 minutes. Rub liquid detergent into area; rinse. If stain remains, apply a few drops of ammonia and repeat detergent treatment. Lead pencil may be removed from some fabrics with a soft eraser.
Butter Chocolate Cosmetics Cream Gravy Grease Mayonnaise Milk Oil Ring-around-the-collar Sauces Shortening Smoke Soot Vomit Wax	Soak stain in cold water for 30 minutes. Rub liquid detergent into stain. Rinse and dry. If stain remains, sponge with a safe cleaning fluid and dry. Repeat if necessary.
Candle Wax Paraffin	Scrape excess off surface and place fabric between several layers of paper tissue and press with warm iron. Remove remaining stain with a safe cleaning fluid, bleach appropriate for the fabric type, or ammonia.
Candy (nonchocolate) Catsup Coffee Egg Tea (no cream) Vegetables	Sponge stain with cold water. Soak for 30 minutes in detergent. Sponging with vinegar followed by alcohol or bleach appropriate for the fabric may remove final traces.
Carbon Paper (duplicating) Ink (ballpoint)	Sponge with alcohol. If stain remains, sponge with safe cleaning fluid.
Crayon	Scrape off excess. Sponge detergent onto stain. Rinse and dry. If stain remains, sponge with safe cleaning fluid.

Table 21.1 – Continued

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Scorch	Work detergent into stain immediately. Rinse. If stain remains, apply hydrogen peroxide and ammonia. Rinse. Severe scorching damages fabrics and cannot be removed.
Shoe Polish	Work detergent into stain and rinse. Sponge with alcohol and rinse. Apply safe cleaning fluid or turpentine. Depending on the kind and color of polish, several methods may need to be used.
Yellowing	Wash in hot water with an increased amount of detergent and as strong a bleach as is safe for the fabric. Prolonged soaking may be necessary. Use a color remover on white fabrics.

Table 21.1 – Continued

The start of the washing cycle is one of the most important operations in the wash formula. The start of the washing cycle is often referred to as the break. The ***break*** is the filling of the tub with water to proper levels. Alkalies may be added during the break to increase soil removal. The higher the temperature on the break, the faster the washing action. Breaks usually run from five to ten minutes. A properly executed break will remove approximately 60 percent of the soil from fabrics.

Water levels influence the level of cleaning power. If the wash formula calls for a water level of six inches and the machine is actually filling with eight inches of water, the concentration of laundry products is diluted and the cleaning power is diminished. If the water level changes, the wash formula should also change.

Bleaching is done when light, running suds are in the wash water. Suds slow the bleaching action until the bleach has a chance to become evenly distributed throughout the load. Bleach is selective and immediately attacks dirt. If there is considerable soil left in the load and little suds, the bleach will not distribute evenly. With the correct hot water temperature and pH level (10.2-10.5, which is alkaline), a five to ten minute bleach cycle is sufficient. The effectiveness of a bleach cycle depends on the water temperature and level of alkalinity.

Rinsing is a matter of dilution, and usually three minutes after the water level is obtained is a sufficient amount of rinsing time. Rinsing any longer than this wastes time. Alkalies in detergents speed up the rinsing process.

The chemical energy of detergents can be understood by visualizing a single detergent molecule. The shape of this molecule can be compared to a balloon on a stick. It has a round head and a rod-like tail. The balloon, or head, loves water and dives in to immerse itself. However, the stick, or tail, hates water and tries to escape it by sticking out into the air or attaching itself to anything other than water, such as the side of the washer, dirt particles, or fabric. Millions of these molecules become active when detergent is added to wash water.

As the water is agitated, the molecule tails, which have become attached to the soil particles, literally pull the soil away from the fabric. The clean fabric surfaces then quickly attract the water-hating tail of more molecules trying to escape the water, and these pull more soil away from the fabric. The dirt particles and the clean fabric become covered entirely with molecules, their heads facing the water. Since the heads repel each other, the dirt and the fabric have no desire to make contact. The dirt particles remain suspended until rinse water flushes them away and leaves the fabric clean. Similar chemical action takes place when suds are applied to any hard surface or to the body. Oil and dirt particles are pulled away from the surface or skin, surrounded by molecules that repel each other, and floated away by rinse water.

Thermal Energy – Water temperature is an important factor affecting the laundry process. Water temperature helps to determine how clean and how wrinkled fabrics become during washing. Correct water temperature can also ensure the durability of a fabric finish and control the amount of fading caused by washing. Apparel and textile products can be washed in hot, warm, or cold water. Increased water temperatures generally result in increased soil removal.

Hot water cleans quickly and sanitizes, but it is not suitable for all fabrics. For proper laundering performance, a water heater should be set to deliver 140°F water at the tap. At this setting, the wash water in an automatic washer with the controls set on hot will be approximately 130°F with 10° lost as a result of the cooling effect of the washer components and items in the tub.

White fabrics, light colorfast fabrics, and heavily soiled permanent-press fabrics should be washed in hot water (130°-160°F or 54°-71°C) using heavy duty, all-purpose detergent. Hot water is essential in removing oily and greasy soils. After several washings in reduced water temperatures, heavily soiled or white fabrics may become yellow or gray and dingy looking.

Warm water reduces fading, preserves permanent-press finishes, and reduces wrinkling and shrinkage. Warm water is a mix of half hot and half cold water. The temperature of warm water is about 100°F. While some loads of heavily soiled items may require a hot water wash, the majority of loads can be washed effectively in warm water when proper laundry procedures are followed. Colored fabrics, lightly soiled fabrics, permanent-press fabrics, and noncolorfast fabrics should be washed in warm water (90°-110°F. or 32°-43°C.) using a mild detergent.

Cold water does not clean as well as hot water, but it reduces the wrinkling and fading of fabrics and saves energy. The temperature of a cold water wash is usually about 60°F. Since cleaning performance is minimized in a cold water wash, a liquid detergent or a predissolved powder detergent should be used. In water temperatures below 60°F, detergents are virtually ineffective — they do not work. Oily soils are not emulsified and they redeposit on laundry causing laundry to remain soiled.

The thermal energy of warm or cold water temperatures can be supplemented somewhat by increasing the amount of detergent used, bleaching if possible, and presoaking or pretreating stains. The cost of additional detergent and bleaches used in cold and warm water washing may be greater than the cost savings gained from using the lower wash temperature.

To conserve energy, the coolest water temperature available that still produces desired results should be used. In addition, laundry should be rinsed in cold water. A cold rinse is effective in rinsing laundry washed in any temperature.

Laundry Equipment

Commercial laundry equipment is similar to laundry equipment used in the home. The main differences between commercial laundry equipment and home laundry equipment are the size and load capacity. ***Load capacity*** is the amount of laundry a washer or dryer can thoroughly wash or dry. Load capacity is measured by pounds and varies among machines. For example, a home washing machine typically holds from twelve to sixteen pounds of laundry. In comparison, a commercial washing machine can have a load capacity as high as 600 pounds.

Commercial Washers – Commercial washers clean laundry by using a combination of mechanical agitation and detergent action. Water motion is created in the inner tub of the washer causing fabrics to bend, flex, and scrub against each other as a detergent solution is forced through them.

A common type of commercial washer is the front loader. A ***front loader*** is a washing machine that is loaded from the front rather than the top. Front loaders have extensions called ***baffles*** on the inside of the inner tub. Baffles help move laundry as it tumbles. Front loaders use the principle of gravity to tumble laundry repeatedly. During tumbling, a detergent solution moves through the wet laundry and picks up, dissolves, and removes soils as the laundry rubs together. The inner tub of the front loader moves in a clockwise direction and then reverses to a counter clockwise direction. Laundry falls once it reaches the top of the tub. This differs from the top loading washing machine found in the home in that the top loader agitates laundry back and forth. An example of a front loader washing machine is shown in figure 21.1.

There are two basic ways that washers measure the amount of water filling the tub. In some washers, the water runs for a certain amount of time and then turns off. This method is known as ***time fill***. If the water pressure is low or inconsistent, the water may not always reach the desired level needed to wash effectively. Washers also use the ***pressure fill method***. In the pressure fill method, water continues to run into the tub until it reaches a desired level. When the desired level is reached, the water turns off. Since the same water level is always reached, the pressure fill method is more effective and is the method currently used by most commercial washers.

Most commercial washers have a variety of cycles from which to choose. A ***cycle*** is an automatic series of steps that a washer goes through in order to wash a load effectively. A standard cycle starts when water enters the tub. Laundry is then agitated or tumbled, and the wash water is extracted. More water is used to rinse the laundry. Many washers use a spray rinse followed by an agitated deep rinse and an additional spray rinse. After the rinse, water is extracted. ***Extraction*** is the process of spinning, draining, and/or squeezing water out of laundry. When the inner tub of the washer spins, water is forced out through holes in the tub and drained.

Commercial washers allow the user to select a cycle that best suits the wash load. The amount of soil, the kind of fabric, the construction of the items, the color of the fabric, and the equipment used should be considered when choosing a wash cycle. A standard cycle is a permanent-press cycle. At the end of the permanent-press cycle, there is a cool-down period in which cooler water is used to cool garments and minimize wrinkles that might be set in during extraction. Many washers have soak or prewash settings to meet special needs. The cycles of washing machines differ, but all washers control the following conditions:

- fill
- wash and rinse temperature ranges
- wash time
- total cycle time
- agitation speed
- spin speed

Some laundries may divide the wash process into two parts with two separate machines. Laundry may be washed in a washer and then loaded into a cart and taken to an extraction machine. An ***extraction machine*** is a machine that spins or squeezes water from laundry. The preferred method is to use a washer/extractor machine. A ***washer/extractor machine*** is similar to a home washing machine in that the machine both washes and extracts water from laundry. Washer/extractor machines reduce the amount of laundry handling and physical lifting. In addition, the cycle time is shortened, and the potential for accidents is decreased because the floor does not become wet.

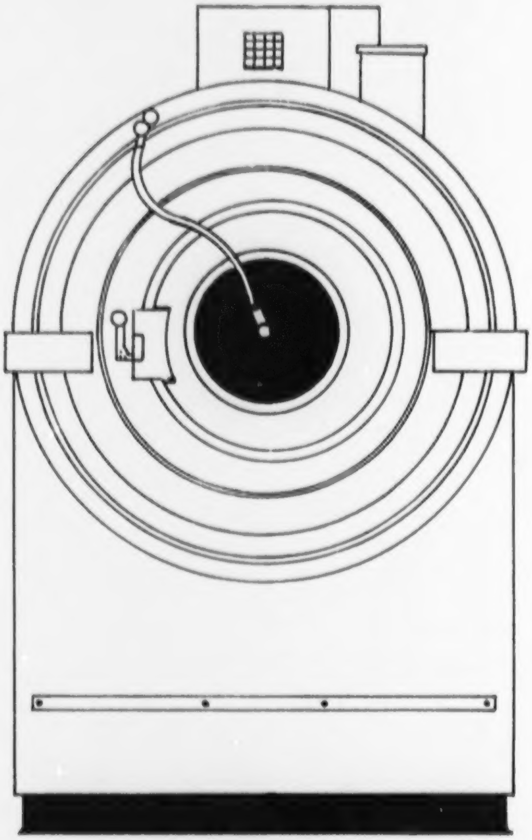

Figure 21.1

Sophisticated laundry equipment is used in some laundries. Some commercial washers are controlled by a computer that can be programmed to maintain the correct water temperature and to dispense the correct amounts and types of laundry products during the appropriate stage of the washing process. Hoses hook directly to dispensers of liquid laundry products, and products are automatically added to the washer in the correct amounts. Computerized washers allow the user to push buttons that describe the type of wash desired. Some commercial washers have programmed cards that the operator inserts into a special location on the washer. These programmed cards contain information on the types and amounts of laundry products to be dispensed, the length of cycles, and the water temperature.

When using a commercial washer, an individual can achieve effective results by observing the following guidelines:

- Follow the manufacturer's instructions.
- Load the washer properly.
- Set the washing controls according to the size and type of the load.
- Select the correct water temperature. Provide an adequate supply of hot water, if needed.

- Use a suitable detergent or soap. Measure according to the amount of water. Too much detergent produces too many suds, and laundry is not rinsed clean. Too little detergent does not provide adequate cleaning power.
- Clean the inside and outside of the washer after each use.
- Clean the lint filter after each use. A ***lint filter*** is a device found in washers and dryers that collects lint as water or air passes through it.
- Leave the lid open until the tub is dry.
- Wipe up laundry product spills inside and outside the washer.
- Do not launder rags or cloths used with flammable liquids such as gasoline, paint thinners, and cleaning solvents.

Commercial Dryers – ***Drying*** is a process of evaporation that occurs naturally. Drying occurs faster when the temperature of the air is increased. For example, laundry on an outdoor clothes line will dry faster on a warm, dry day than on a cold, damp day. Drying also occurs faster when the rate of airflow across the wet surface is increased. For example, laundry on an outdoor clothes line dries faster on a breezy day than on a calm day. A ***commercial dryer*** is a mechanical device that controls temperature and rate of airflow. Commercial dryers save time and energy, make articles soft and fluffy, help remove wrinkles, and prevent fading associated with sunlight. The main disadvantage of commercial dryers is that improper drying can increase shrinkage, damage some fabrics, and cause wrinkles (when the dryer is overloaded). An example of a commercial dryer is shown in figure 21.2.

A commercial dryer operates by taking in air from outside of the dryer and heating it. Heat for drying is produced by a gas flame, steam, or an electric element. A thermostat controls the temperature of the heated air. A ***thermostat*** is a device that regulates temperature to a certain level. The level may be fixed by the manufacturer of the dryer or set by the user. Heated air goes into a revolving cylinder or drum that is turned by a motor. Like the front loader washing machine, the dryer drum has baffles to help move wet laundry around as it dries. As the drum tumbles, the dryer motor turns a fan that circulates heated air over and through wet laundry. As the heated air circulates, it absorbs moisture. The moistened air is exhausted out of the dryer to the outdoors, and more hot, dry air enters the dryer drum. This process continues throughout the drying cycle. When there is no longer a significant amount of moisture being evaporated from the laundry in the dryer drum, the temperature of the air rises to the level permitted by the thermostat of the dryer, and the temperature of the laundry approaches the temperature of the surrounding air.

The length of time required to dry laundry depends upon the following factors:

- the temperature at which the dryer is set and the air circulation in the dryer – The amount of time required for drying shortens as the drying temperature is increased.
- the size of the load – As the size of the load increases, drying time increases.
- the amount of moisture in the laundry – When most of the water is extracted from laundry during the washing process, the drying time will be shortened.
- the type of fabric – Lightweight fabrics dry more quickly than heavy fabrics.

Different methods are used to time the drying process. The length of time a dryer will operate can be determined by setting a timer, monitoring the load, or allowing electronic moisture sensors to monitor the load. A ***timer*** is a control dial marked in minutes. When the timer is set for an excessive length of time, overdrying can occur. Overdrying causes some fabrics to shrink, wrinkle, and/or discolor. Stiffness of cotton fabrics also occurs. Since laundry varies in type of fabric, size, and amount of moisture retained from the wash, proper drying time is difficult to judge. To obtain satisfactory results when using a timer controlled dryer, the operator must have the ability to correctly judge the length of time it will take a load to dry.

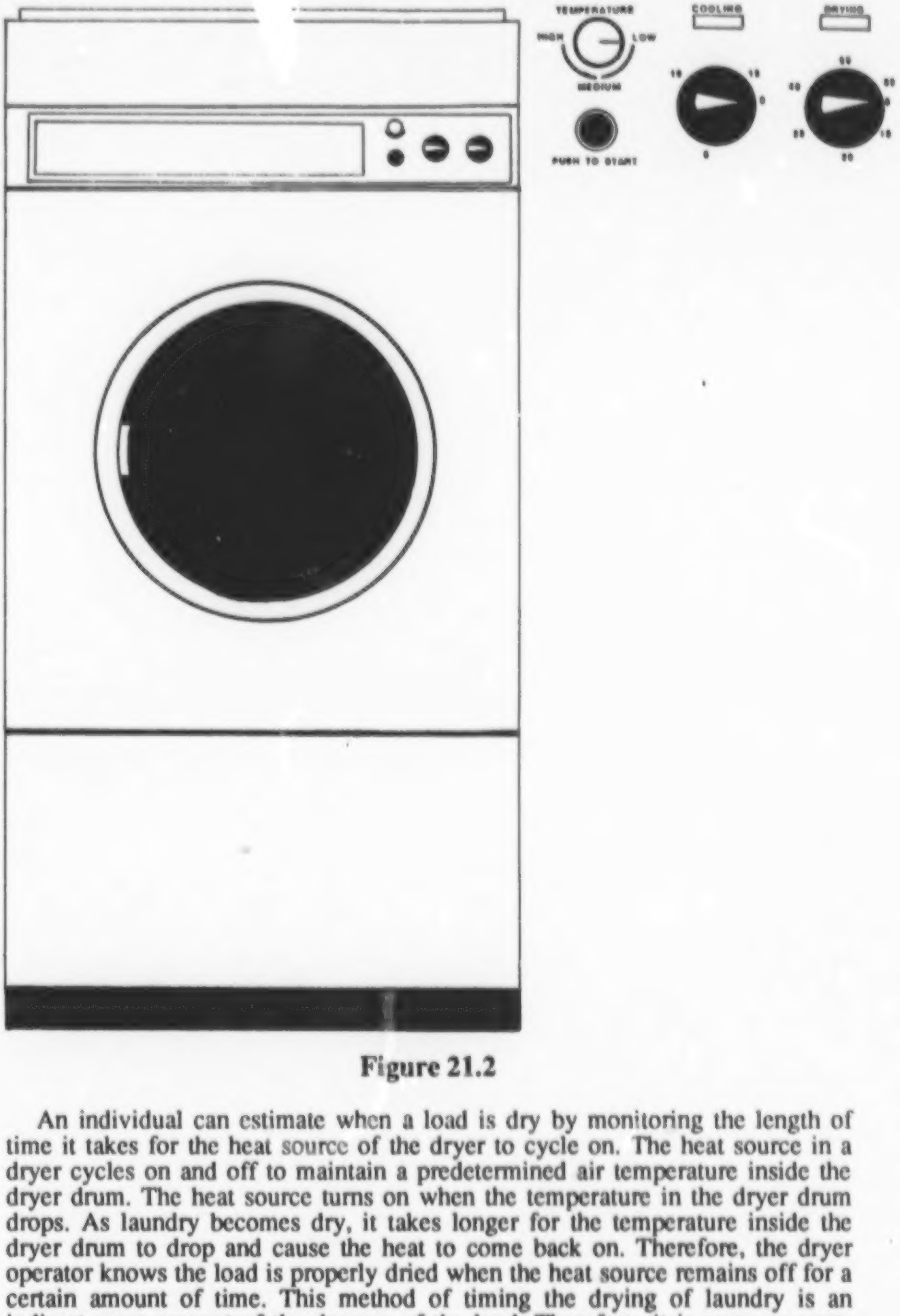

Figure 21.2

An individual can estimate when a load is dry by monitoring the length of time it takes for the heat source of the dryer to cycle on. The heat source in a dryer cycles on and off to maintain a predetermined air temperature inside the dryer drum. The heat source turns on when the temperature in the dryer drum drops. As laundry becomes dry, it takes longer for the temperature inside the dryer drum to drop and cause the heat to come back on. Therefore, the dryer operator knows the load is properly dried when the heat source remains off for a certain amount of time. This method of timing the drying of laundry is an indirect measurement of the dryness of the load. Therefore, it is more accurate than time controlled drying.

Some commercial dryers contain built-in sensors in the dryer drum or door to monitor the level of moisture in laundry. When wet laundry tumbling in the dryer comes in contact with the sensors, the moisture in the laundry completes an electric circuit. When there is not enough moisture in the laundry to complete the circuit, the dryer tumbles the laundry for a cool-down period and then stops.

Dryers equipped with moisture sensors are effective since they are less likely to overdry or underdry laundry.

When using a commercial dryer, an individual can achieve effective results by observing the following guidelines:

- Do not overload a dryer. Overloading makes the machine work harder, results in longer drying time, and causes wrinkles.
- Dry items of similar weight and construction together to avoid overdrying or underdrying.
- Clean the lint filter after each use of the dryer. A clean lint filter ensures proper air circulation throughout the dryer and prevents the possibility of a fire.
- Do not machine dry plastic, fiberglass, or foam rubber items such as foam rubber pillows, plastic aprons, shower curtains, and sheer curtains made of fiberglass. Drying these items may present a fire hazard. Glass fibers from fiberglass items can break and remain in the dryer where they can become attached to other fabrics and cause skin irritations. These items may be placed in the dryer and dried using air only and no heat. However, tumbling may damage plastic and metallic fabrics.
- Never machine dry items containing flammable liquids, solids, or cleaning solvents. In addition, never use solvents such as gasoline, kerosene, furniture polish, or other flammable liquids in a dryer. Fire and explosion can occur. Never use or store flammable liquids near a dryer.
- Clean air intakes and exhaust ducts periodically to ensure optimum operation. Improper venting tends to increase drying time. Longer drying time results in the use of more energy and higher operating costs.
- Never allow children to play near or operate a dryer. Serious injury can occur if a child crawls inside of a dryer and the dryer is turned on.
- Never use the dryer door opening as a step stool.
- Read and follow manufacturers' instructions on laundry products used in the dryer.

To make efficient use of drying time, individuals should carefully sort laundry before placing it in the dryer. For example, items that require pressing can be placed in a load together so the load can be removed and pressed while slightly damp. Other loads can consist of items that do not require pressing or items that can be pressed without dampening. Starched laundry should also be sorted and dried separately from unstarched laundry.

COMMERCIAL DRY CLEANING

Like commercial laundries, commercial dry cleaners also provide customers with clean apparel and textile products. However, dry cleaners use chemicals rather than water to clean items. A ***full-service dry cleaner*** offers complete cleaning services including pretreating and pressing. Some dry cleaners offer bulk cleaning services in addition to full-service dry cleaning. ***Bulk cleaning*** involves placing apparel and textile products in washer/extractors, allowing a full cleaning cycle to run, and drying the items. Items that are bulk cleaned are not pretreated, checked for stains after cleaning, steamed, or pressed. Sweaters and other items that are not heavily soiled or do not need to be pressed are usually bulk cleaned. The charge for bulk cleaning services is often based on the weight of the items to be cleaned.

Before apparel and textile products are dry-cleaned, they must first be prepared for cleaning. If apparel and textile products are not adequately prepared for dry cleaning, they can be damaged or destroyed during the cleaning process. To avoid damaging customers' belongings, dry cleaning employees should be thoroughly trained and follow proper procedures throughout the dry cleaning process.

Precleaning Procedures

Before actually dry-cleaning apparel and textile products, employees test them for colorfastness and durability. Some fabrics should not be dry-cleaned or they should be cleaned using a special process. For example, leathers and furs must be specially treated. They should never be cleaned with garments constructed from other fabrics. Some fabrics made of manufactured fibers should not be dry-cleaned because they are not able to withstand the dry cleaning solvents. A ***solvent*** is a specific type of chemical cleaning agent. Solvents mix with staining materials, dissolve them, and then form a removable liquid or powder that is washed away.

In order to test the durability and colorfastness of apparel and textile products, dry cleaners expose an inconspicuous area of the fabric, such as an inner seam allowance, to a small amount of dry cleaning solvent. If the color does not bleed and the fabric remains intact, the item can be dry-cleaned safely.

Pretreating is an important step in the dry cleaning process. Dry cleaners can usually remove stains if the soiling material is identified. It is important to identify the soiling material because there are two types of stain removal chemicals. ***Wet side chemicals*** are used to remove stains that contain water. ***Dry side chemicals*** are used to remove stains that do not contain water. For example, wet side chemicals are frequently used to remove beverage stains while dry side chemicals are generally used to remove make-up, oil, and grease stains.

When wet side chemicals are used to remove stains, the stains are moistened, flushed, and then aired. The treated item cannot be cleaned until the moistened area is completely dry. When dry side chemicals are used to remove stains, tamping may be done. When removing any type of stain, employees should work with the smallest stain area possible. Cleaning chemicals should not be brushed onto or allowed to spread to unsoiled areas of the item.

Cleaning Procedures

After apparel and textile products are pretreated, they are placed in a washer/extractor machine where they are dry-cleaned. The washer/extractor machines resemble washer/extractor machines used for laundering. Although the cleaning process is referred to as dry cleaning, the solvents used to dry-clean are not actually dry. The cleaning solvents used are wet. The process is called ***dry cleaning*** because water is not used and the solvents that are used dry quickly.

Although the commercial dry cleaning process is safe for most apparel and textile products, some items are too delicate to withstand even mild mechanical cleaning action. Delicate items such as antique lace and hand-stitched samplers often have a great deal of sentimental value, and care should be taken to clean the items in a safe manner.

Delicate items are often placed in leakproof containers that contain small amounts of dry cleaning solvent. The items are left to soak and are not moved in any way. The items are monitored carefully and are removed from the cleaning solution when they are thoroughly cleaned. Some dry cleaners allow the items to air-dry while others dry them in dryers. Before cleaning any item in this manner, employees should make sure the work area is well ventilated.

Dry Cleaning Equipment

Washer/extractor machines operate much like front loading washing machines. Inside the washer/extractor there is a large metal basket that tumbles the apparel and textile products. The cleaning solvent constantly passes through filtering systems that remove soil and catch foreign materials.

Most of the filtering system is located outside of the machine, often in the back. As the dry cleaning solvent is filtered, it first passes through button traps. ***Button traps*** catch buttons, items left in pockets, and other items that may come off of apparel and textile products. After the solvent passes through the button traps, it passes through filters that remove coloration. When dyes bleed, these filters prevent the bleeding dye from damaging other apparel and textile products.

The filters operate like an automobile oil filter. There are rods in the centers of the filters that continuously push the solvent through while removing and containing dirt, oil, and odors. The filters pump the purified solvent back into the washer/extractor and the entire process is repeated. Because of the continuous filtering action, apparel and textile products are always being cleaned with fresh solvent.

The filtering systems may pump the solvent back into the washer/extractors at a rate of one gallon per minute. In one minute, sixty gallons of dry cleaning solvent are cleaned, deodorized, and pumped back into the machine to begin the cleaning process again. The filters are changed periodically to ensure that the cleaning solvents are always filtered properly.

The washer/extractors are able to remove almost all stains that remain intact after pretreating. However, some stains demand further attention. Spotters are responsible for removing any stains that remain. ***Spotters*** are dry cleaning employees who use a variety of chemicals, brushes, and steam guns to remove stubborn stains.

After the cleaned apparel and textile products are extracted, they are dried unless customers have requested an additional process such as flameproofing or mothproofing. Commercial dry cleaning dryers resemble dryers used in commercial laundries. They are front loading, but they do not reach the same high temperatures. Dry cleaning dryers generally do not reach temperatures above 120°F.

Postcleaning Procedures

After apparel and textile products are dried, they often appear ready to wear. Before apparel and textile products are ready to be returned to customers, however, they must be finished. The finishing stage of dry cleaning involves pressing apparel and textile products and/or hanging them in steam cabinets. The steam in the steam cabinets loosens the garment fibers and usually results in items assuming their original shapes.

Commercial dry cleaners also offer blocking services. ***Blocking*** is the process of shaping or molding a garment to return it to its original shape. Sweaters often lose their shape over time, but blocking can return the sweaters to their original shapes. Items that have been blocked often appear new.

Points to Remember

- Laundry employees should be thoroughly trained in the correct use of laundry products such as presoak products, soaps, detergents, bleaches, fabric softeners, and starches.
- Apparel and textile products should be sorted into a minimum number of categories according to characteristics such as the following: color, soil, size, texture, and type of handling required following the laundry process.
- Methods used to treat stains include soaking in a presoak product, pretreating with a stain remover, and removing using a stain removal guide and stain removal kit.
- The following types of energy are necessary to remove soil from fabric:
  - mechanical (agitation or rotation of washer tub)
  - chemical (laundry products)
  - thermal (hot, warm, or cold water)
- Commercial washers may include features such as the following: large load capacity, loading from the front, variety of cycles, extraction cycle, computerized control, and automatic dispensing of laundry products.
- Commercial dryers control temperature and rate of airflow during the drying process which saves time and energy, makes articles soft and fluffy, helps remove wrinkles, and prevents fading of garments (such as caused by sunlight).
- The length of time required to dry laundry depends on the temperature of the air circulating in the dryer, the size of the load, the amount of moisture in the laundry, and the type of fabric.
- Commercial dry cleaners usually offer full service dry cleaning and bulk cleaning.
- Before apparel and textile products are dry-cleaned, they should be pretreated and tested for colorfastness and durability.
- Apparel and textile products are dry-cleaned in washer/extractor machines that constantly filter the dry cleaning solvent to remove bleeding dye, dirt, oil, and odors.

Words to Know

alkali
baffles
bleach
blocking
bluing
break
builders
bulk cleaning
button traps
chemical energy
chlorine bleach
commercial dryer
cycle
dispersing
dry cleaning
drying
dry side chemicals
emulsifiers
eutrophication
extraction
load capacity
mechanical energy
oxygen-based bleach
pH level
presoak product
pressure fill method
sequestering
soap
soap curd
soiling
solvent
sorting
spotters
stain removal kit
stains
starch
suds control agent
surfactant
tamping
thermal energy

extraction machine
fabric softener
fluorescent whitening agents (FWAs)
flushing
front loader
full-service dry cleaner
lint filter
thermostat
time fill
timer
washer/extractor machine
wet side chemicals
wetting

Questions for Review

1. Why should laundry employees be thoroughly trained in the correct use of laundry products?
2. What general guidelines should be followed when using laundry products?
3. For what purposes are presoak products, soaps, detergents, bleaches, fabric softeners, and starches used?
4. Why should laundry be sorted into groups that can be washed together safely?
5. Why is it important to repair damaged apparel and textile products before laundering?
6. How do the stain treatment methods of soaking, pretreating, and stain removal differ?
7. How do mechanical energy, chemical energy, and thermal energy differ?
8. What benefits are derived from washing in hot water, warm water, and cold water?
9. What are the main differences in commercial laundry equipment and home laundry equipment?
10. What washing conditions are controlled during a cycle?
11. By what process does a commercial dryer dry laundry?
12. What factors affect the length of time required to dry laundry?
13. What services are offered by full-service dry cleaners?
14. Why should apparel and textile products be tested for durability and colorfastness before being dry-cleaned?
15. How do wet side chemicals and dry side chemicals differ?
16. Why is the term *dry cleaning* an inaccurate description of the dry cleaning process?
17. What purposes do the filters on washer/extractor machines serve?
18. What types of procedures are completed after apparel and textile products are dry-cleaned?

22

Safety and Sanitation for Laundering, Pressing, and Dry Cleaning

ESSENTIAL ELEMENT

- Demonstrate safety and sanitary procedures while laundering, pressing, or dry cleaning.(q10C)

OBJECTIVES TO ACHIEVE

- Determine appropriate safety procedures to observe when laundering, dry cleaning, and pressing apparel and textile products.

- Outline effective sanitation methods for use when laundering, dry cleaning, and pressing apparel and textile products.

Many times, employees ignore preventive measures and safety programs. As a result, accidents occur. Most accidents are caused by carelessness and are avoidable. Accidents happen when individuals are irresponsible or do not care about their work. Laundry and dry cleaning employees are responsible not only for their own safety but for the safety of others in the workplace. Benefits of reducing accidents include lower insurance premiums, maximized productivity, and a lower absentee rate resulting in higher morale among co-workers.

Irresponsible behavior leads to many accidents. Irresponsible behavior includes attempting tasks without having proper training, removing safety devices from equipment, operating machinery at unsafe speeds, using defective equipment, using equipment improperly, and failing to use safety devices. Employees can prevent accidents by following proper procedures and acting maturely when using equipment and supplies.

Unsafe physical conditions also contribute to the accident rates in commercial laundries and dry cleaners. Unsafe physical conditions include inadequate guards on machinery, defective equipment, hazardous processes or procedures, inadequate lighting, inadequate ventilation, and improper dress. By correcting these factors, individuals can prevent accidents. Additional information regarding safety and sanitation is included in Chapter Four.

SAFETY PROCEDURES

Laundry

Most commercial washers have safety features. ***Safety features*** are special parts included on a piece of equipment to protect the operator from harm. It is important that laundry employees learn about the safety features of commercial washing machines in order to avoid injury. Safety features include the following:

- ***lid switch*** – keeps the inner tub from spinning and/or agitating when the lid is open
- ***safety brake*** – keeps the inner tub from spinning and/or agitating when the lid is open
- ***push-to-stop timer*** – allows the operator to stop a cycle in progress
- ***interlocking device*** – prevents the lid of the washer from being opened while the tub is in motion

It is important that an individual never place his or her hand or arm in a moving washer. A moving washer can pull a hand or arm in and cause severe injury and/or disfigurement.

Like commercial washers, commercial dryers also have safety features to protect the operator. It is important for laundry employees to learn about the safety features of dryers in order to avoid injury. Safety features include the following:

- ***safety door switch*** – keeps the dryer from heating or tumbling when the door is open
- ***separate start button*** – will not allow the dryer to turn on until the controls are set, the door is closed, and the start control is pushed or turned
- ***friction door latch*** – allows the dryer door to be opened from the inside; prevents small children from being trapped inside
- ***limiter control*** or ***motor protector*** – guards against overheating, heat source turns off if drum stops tumbling

The safety features on commercial laundry equipment are effective in preventing accidents. However, safety features only prevent accidents when employees follow established safety rules. Employers should explain safety policies and practices thoroughly to all employees. In addition, periodic meetings can be held to review safety features and information.

Dry Cleaning

Even though safe dry cleaning solvents have been developed, employees can suffer injuries if they do not use solvents properly. If a dry cleaning solvent is spilled on the skin, it should be washed off immediately. If solvent is spilled on clothing that is being worn, the clothing should be removed immediately and aired out until the solvent has completely evaporated.

When using dry cleaning products and equipment, employees should observe the following safety guidelines:

- Check dry cleaning equipment for proper operation. If equipment is not operating properly, notify a supervisor immediately.
- Handle dry cleaning solvents carefully. Do not spill them on anything.
- Maintain adequate ventilation in the work area.
- Do not put dry cleaning solvents into a washing machine.
- Do not put garments damp with dry cleaning solvent into a commercial dryer.

Dry cleaning solvents should be stored in safe areas away from sparks and flames. Even sparks from fans can be dangerous. Nonflammable solvents do not ignite when they come into contact with sparks or flames, but they can break down and produce poisonous vapors.

Pressing

Commercial pressing equipment can become very hot and cause serious burns if it comes into contact with skin. Equipment that uses steam to press garments can also cause burns if used incorrectly. The steam produced is extremely hot and can burn skin just as easily as hot irons. Whenever using any type of pressing equipment, employees should not touch the pressing surfaces.

Commercial pressing equipment is often bulky or heavy. Employees should not attempt to move any pieces of pressing equipment. Since the equipment is often located in the safest possible area, moving it could create hazardous conditions. Some pieces of pressing equipment are foot operated. To avoid foot injuries when operating this type of equipment, employees should wear sturdy shoes.

Employees should also be cautious when using conventional irons such as those used in the home. When an iron is not in use, it should be placed on the heel in an upright position. The ***heel*** is the part of the iron that acts as a rest and holds the iron in a well-balanced, upright position. When irons are not in use, they should always be turned off and unplugged. Employees should practice turning off irons and unplugging them whenever pressing is completed. In order to prevent shocks, employees should empty any remaining water from steam irons after use.

Iron manufacturers have designed controls that supply only the amount of heat an iron needs. The controls prevent irons from reaching excessively high temperatures and becoming fire hazards. Manufacturers have also designed irons so that the heating elements are insulated from the metal bodies. This reduces the risk of electrical shock. In addition, well-designed irons are insulated so that heat is concentrated at the pressing surfaces and the upper surfaces remain cool.

SANITATION PROCEDURES

Sanitation is the process of making something clean or sterile. Clean or sterile conditions promote hygiene and prevent disease. Sanitation is an important aspect of laundering and dry cleaning. Laundry and dry cleaning employees should have a knowledge and understanding of sanitation and disinfection principles in order to efficiently kill germs and prevent the contamination of apparel and textile products. In addition, employees should also practice good personal hygiene. Keeping oneself clean reduces the risk of spreading germs. Maintaining high standards of cleanliness in commercial laundries and dry cleaners also prevents liability claims and loss of future business.

Local, state, and federal health departments employ inspectors who monitor the cleanliness of business establishments. The inspectors are also responsible for making sure commercial laundries and dry cleaners satisfy sanitation regulations. Inspectors often visit laundry and dry cleaning establishments unannounced. Employees should avoid interfering with the work of an inspector. Also, any suggestions for improvement made by an inspector must be followed.

Laundry

Apparel and textile products can be sanitized by washing in hot water. The wash water temperature should be at least 130°F. If wash water is not hot enough, some germs may not be destroyed, and laundry will not be sanitized.

Apparel and textile products can also be sanitized in the dryer. Some commercial dryers are equipped with ultraviolet lamps. These lamps produce light rays that sanitize the laundry as it tumbles in the dryer.

Commercial washing machines must be sanitized on a regular basis to control the spread of germs from one load of laundry to another. If a washing machine harbors germs, apparel and textile products will not be sanitized no matter how hot the wash water is. Liquid bleach and warm water can be used to sanitize commercial washers. Bleach should be poured into the washer and the washer should be set to run on a sanitize or warm rinse cycle. When the sanitation cycle ends, the washer is sanitized and ready to use for laundering.

Dry Cleaning

Commercial dry cleaners do not use hot water to sanitize the apparel and textile products they clean. The cleaning solvents used in dry cleaning machines sanitize apparel and textile products during the dry cleaning process. The dry cleaning solvents are continuously pumped through a series of tanks and filters that catch debris, pump away germs, and keep the solvents sanitized. Apparel and textile products are never exposed to stagnant solvent. ***Stagnant solvent*** is solvent that is allowed to collect in a pool. Since stagnant solvent is not continuously filtered, germs are allowed to accumulate.

The quality of air in any dry cleaning establishment must be monitored closely. Dry cleaning solvents have distinct odors and should not contaminate the air. If odors are present, solvents may be leaking from dry cleaning machines, or they may not be stored properly. Air in a dry cleaners should constantly be recirculated with fans to ensure that it is not contaminated by solvents. If the smell of cleaning solvent is noticeable, a supervisor should be notified immediately.

Pressing

If apparel and textile products have not been properly sanitized during the laundering or dry cleaning process, they must be cleaned again before being pressed. Pressing does not sanitize apparel and textile products. Therefore, apparel and textile products must be sanitized before they reach the pressing stage of the commercial laundering or dry cleaning process.

An important aspect of pressing sanitation is keeping pressing equipment clean and free of germs. Equipment that looks clean may still be contaminated with germs that are invisible to the naked eye. Dirty or soiled apparel and textile products should not be pressed since germs can easily be transferred to pressing equipment. The pressing stage is the final stage of the commercial laundering and dry cleaning process. If pressing equipment is not clean and sanitized, germs can be transferred to apparel and textile products and the laundering or dry cleaning process will have to be repeated.

Hot steam and industrial disinfectants can be used to sanitize commercial pressing equipment. The surfaces of pressing equipment should be cleaned with a disinfectant regularly. Press cloths and stuffed or molded pressing aids should also be cleaned regularly to control the spread of germs.

Points to Remember

- Most accidents are caused by carelessness and irresponsible behavior and can be prevented by following proper procedures and acting maturely.
- Commercial washers and dryers include safety features that protect laundry employees from harm.
- Dry cleaning employees should use caution and avoid spilling solvents, store solvents in safe areas, and maintain adequate ventilation in the work area.
- To prevent accidents when using commercial pressing equipment, individuals should avoid touching pressing surfaces, avoid moving equipment, turn off and unplug equipment when it is not in use, and empty water from steam irons after use.
- Apparel and textile products can be sanitized by washing in hot water or drying in a dryer equipped with ultraviolet lamps.
- To control the spread of germs during pressing, equipment should be sanitized regularly. Dirty apparel and textile products should not be pressed.

Words to Know

friction door latch
heel
interlocking device
lid switch
limiter controller
motor protector
push-to-stop timer
safety brake
safety door switch
safety features
sanitation
separate start button
stagnant solvent

Questions for Review

1. What safety features are found on commercial washing machines, and how do they protect laundry employees?
2. What are the functions of safety features found on commercial dryers?
3. Why is it important to follow safety guidelines when using dry cleaning equipment and supplies?
4. What safety guidelines should be followed when using commercial pressing equipment?
5. Why is sanitation an important aspect of laundering and dry cleaning?
6. What methods are used to sanitize laundry and dry cleaning?
7. Why is it important to sanitize washers and pressing equipment regularly?

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